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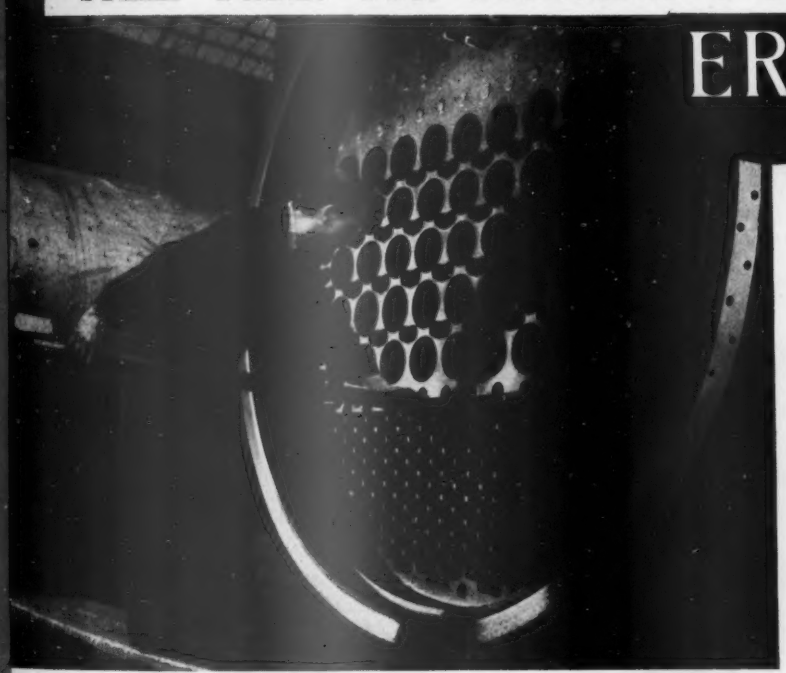

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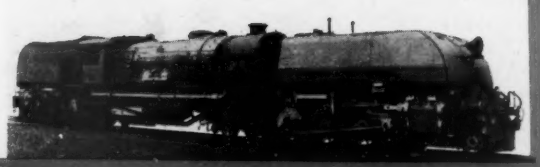

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Decentralisation of Railway Management

INCREASED Regional autonomy for British Railways as a means of increasing their efficiency is advocated by Mr. Harold Watkinson, Minister of Transport & Civil Aviation. In a recent speech at Dorking, he expressed his belief that the pride in, and loyalty to, their Region or line, as the successor of one of the old railway companies, which still exist among railwaymen, should be encouraged by greater Regional independence in matters which do not need control from the centre. This is a view which we have advocated ever since the beginnings of nationalisation. There would be no political interference in the railways, what he termed "the disruptive process of nationalisation, de-nationalisation, acute political controversy, and all the rest." What he envisaged is a new plan of regionalisation. It should follow completion of the primary task, which must be controlling the heavy annual losses of British Railways. The Minister has in mind the re-creation of the Regions, but in a different form. He rightly wishes for a return to some of the old railway names and liveries, which would do so much to engender pride and loyalty among railway staff and also among those who live in the area served by the line. One need not go far to find, for instance the esteem of many Devonians for the Great Western Railway, which extends today to the Western Region, largely because pride and interest in the successor to the G.W.R. have been encouraged. The Regions would give competitive services where geographical factors allowed this. A nucleus of such an organisation already exists in the Area Boards to which many men prominent in trade and industry give their time. Mr. Watkinson would like to see these increased in power. The British Transport Commission would remain to deal with broad matters of policy and finance and to afford the benefits of standardisation of locomotives, signalling, and other matters where use of common equipment results in large savings. The resultant railway system in his opinion would combine the advantages of private enterprise, an element of competition, and a great measure of Regional autonomy. Yet the State still would be able to ensure that its very large investment in the railways was properly safeguarded. The Minister is alive to the dangers of disruptive change. Re-organisation of the railways as outlined by Mr. Watkinson is largely a matter of continuing a process of decentralisation which has already begun. With due care, it could be pursued with a minimum of disturbance to the functioning of the railways.

The late Mr. F. S. Whalley

FEW men in the British locomotive industry have combined technical knowledge with administrative ability to greater effect than the late Mr. F. S. Whalley. Although he was associated with the Vulcan Foundry Limited for more than 50 years, his influence extended throughout the industry. His 11 years' Presidency of the Locomotive Manufacturers' Association included the whole 1939-45 war and the immediate post-war period with all its inherent difficulties. During his long career Mr. Whalley built up the respect and admiration of those who knew and worked with him. It was a source of widespread regret when, in 1954, ill-health forced him to retire from directorships of the Vulcan Foundry Limited and Robert Stephenson & Hawthorns Limited. It was hoped, at the time, that he would enjoy a long and well-earned retirement. His death at the age of 73, less than four years later, will be deeply regretted by the many by whom he was held in high esteem.

Industrial Unrest on Argentine Railways

IT is hard to see how the Argentine State Railways (E.F.E.A.) can be restored to anything approaching their efficiency of 20 years ago until they cease being bedevilled with strikes. Apart from industrial trouble, the situation as to motive power and other equipment is far from satisfactory, despite efforts to make good deficiencies, notably in buying diesel locomotives and steam locomotive spares. Last month a fresh wave of strikes and conflicts began. The motives are not clear. New pay scales were being discussed with the E.F.E.A., and the Thirtieth Railwaymen's Congress was being held at the same time. The latter ended in chaos, when a rival group of railwaymen's leaders elected themselves. Later, the E.F.E.A. broke off negotiations with the Union Ferroviaria (Railway Union), the committee of which was ejected from its headquarters, and began negotiating afresh with the provisional committee. The Union Ferroviaria promptly called a general strike, which was effective all over the country. Meanwhile the Industrial Court ordered return of the premises to the rightful committee, with which negotiations were immediately re-started. This caused another general strike, which was a comparative failure. Finally the establishment of new wage scales was announced, the agreement to be signed by representatives of the grades concerned chosen by free elections. This decision has brought peace for the time being. The Enginemen's Union (La Fraternidad) was not affected.

150th Anniversary of Thomas Cook

THE business of Thos. Cook & Son Ltd. is so vast that it is hard to believe that the first venture in the travel business of Thomas Cook dates only from 1841, when he was aged 32. He was born in Melbourne, Derbyshire, on November 22, 1808. Sponsoring the well-known excursion trip from Leicester to Loughborough to enable 570 supporters to attend a temperance meeting on July 5, 1841, was the first transaction of Thos. Cook the travel organiser. His tours to the Continent began in 1855. At his death in 1892 his organisation was established throughout the world. It is doubtful whether international railway passenger traffic in Europe or rail travel by Europeans in countries such as India would have developed so quickly but for the booking facilities provided by Cook's. The firm has done much to build up the passenger business of railways in Britain and of their services to the Continent. Today its share capital is held by the British Transport Commission. The world of business and industry in many countries and many thousands of holidaymakers rely on Cook's for making their travel arrangements. The organisation has become essential to a civilised community.

Silent-Running Diesel Trains

THE Norfolk branch of the National Farmers' Union is reported to have suggested as a safety measure that brighter lights should be carried by diesel trains so that they may be more easily seen when approaching level crossings. This is an indirect tribute to the silent running of the diesel trains in that area of the Eastern Region which is deserved by most types of diesel multiple-unit train and railcar running in the six Regions of British Railways. In fog and certain other conditions a steam train often cannot be heard until very near a crossing, and most diesel railcars run very quietly. The noise is less than that of many private motorcars, as those who live by a railway can testify. In our experience diesel engine noises are more audible to passengers in the railcars than to people by the line at ground level, as at crossings. Adoption of the N.F.U. suggestion would be difficult, as the present brightness of railcar headlights results in reflection during fog back on to the cab.

Simplified Passenger Coach Construction in France

TO reduce the cost of passenger coach construction, French rolling stock builders, with the advice and encouragement of the French National Railways, have carried out experiments with a view to simplifying design and use of materials. A prototype completed by the Ateliers de Construction du Nord de la France (A.N.F.), a 10-compartment side-corridor second class coach, incorporates a large measure of prefabrication. The latter included completely painted and lined units made up of two half-compartments, back-to-back. The use of laminated products has been avoided on grounds of cost, but plastics and stainless and lightweight steels have been used. Some windows are mounted in rubber frames. The vehicle was tested at the Vitry testing station, where its performance is reported to have equalled that of other recent designs. It is believed that attempts are also being made to reduce the construction costs of open passenger coaches, which do not offer so much scope for economies. At present the side-corridor vehicle seems to be preferred for locomotive-hauled trains in ordinary long-distance trains for both first and second class.

New Sleeping Car Service to West Wales

THE Great Western Railway for many years and its successor, the Western Region of British Railways, have provided West Wales with passenger services from and to London and Cardiff which are good in relation to the population served. The area west of industrial Swansea and Llanelly includes no large towns. With the Irish boat expresses to and from Fishguard Harbour, the services to Carmarthenshire and Pembrokeshire are frequent and reasonably fast. Pembroke Dock, Neyland, Milford Haven, and Fishguard Harbour are the termini of through carriages from and to Paddington. A sleeping car service between Paddington and Milford Haven is to start on December 1; some details are given on another page. How far this is the forerunner of an improved business service which may result from industrial development of Milford Haven remains to be seen. The sleeping car supplements, as for other journeys within England and Wales or within Scotland, are very moderate. Travel in a two-berth compartment with full bedding for £1 plus the second class fare affords greater comfort at the price than is offered by any other railway in the world.

Overrunning a Colour-Light

THE sidelong collision between a steam and an electric train at Gloucester Road, Croydon, on March 4, 1958, arose from the driver of the former overrunning a colour-light signal at a converging junction, itself a short way in advance of one at the facing points of another junction in an unusually complicated layout of connecting lines and spurs. Colonel D. McMullen, whose report is summarised in this issue, found responsibility to rest on the driver but felt he had not received the help he might have expected from the fireman. The result was that the driver became momentarily confused. His normal route was closed by an engineering possession, but he had read the relevant notice. The location of the two signals directly involved had been chosen to meet the requirements of the traffic department, but this and some other cases of overrunning showed certain modifications of the controls and interlocking to be advisable.

Moscow to Teheran by Rail

THROUGH rail communication between Western Europe and Persia, planned for many decades, has at last been realised with the introduction some weeks ago of a through passenger service, with only one change of car, between Moscow and Teheran. This has been made possible by the completion of the standard-gauge line from Teheran to Tabriz, on which work commenced in 1938, and the subsequent conversion to standard gauge of the 5-ft. gauge Azerbaijan Railway from Tabriz to the U.S.S.R. frontier at Djulfa, which gives Persia a unified system. A through train with sleeping and restaurant cars is now operated between Djulfa and Teheran via Tabriz. For their part, the Soviet Railways have added a weekly "soft" car Moscow-Djulfa to the existing trains Moscow-Erevan and Erevan-Djulfa, allowing the traveller to leave Moscow on Saturday afternoon and reach Teheran on Wednesday evening; in the return direction, departure from Teheran is on Monday mornings and arrival at Moscow on Friday evenings. The Intourist organisation, with a view to attracting overland transit traffic, has announced through fares in roubles from Berlin, Warsaw, Vienna, and Prague via Moscow to Tabriz and Teheran, and despite the long detour via Moscow, the route certainly promises the traveller a high degree of comfort and regularity than the intermittent road service from Erzurum (Turkey) to Tabriz which, so far as we are aware, is now the only other public transport service, other than airlines, entering Persia from the west.

Additional Type "2" Diesels for British Railways

THE 1,160-h.p., Type "2," Bo-Bo diesel-electric locomotives built by the Birmingham Railway Carriage & Wagon Co. Ltd. for the British Transport Commission are generally similar to the 30 Type "2" diesels being constructed at the Derby Works of the London Midland Region. Intended for the same range of mixed-traffic duties, both designs incorporate the same engine, a Sulzer pressure-charged six-cylinder in-line 6LDA28 which develops 1,160 b.h.p. at 750 r.p.m. Both have a Bo-Bo wheel arrangement, but there are differences in the electric equipment and control gear which for the Birmingham Carriage & Wagon locomotives are by Crompton Parkinson and Allen West respectively; and for the Derby-built diesels

by British Thomson-Houston for both sets of equipment. Dimensions and service weights are also similar, but the Birmingham Type "2" has a greater continuous tractive effort of 30,000 lb. at 11 m.p.h., compared with 21,300 lb. at 15 m.p.h., mainly because of higher-rated electrical equipment. The first 20 locomotives are to work on the Great Northern Line of the Eastern Region between Kings Cross and Hitchin and Hertford to replace steam locomotives pending electrification. Five are already in service. They are equipped with A.T.C. for working on the main line. A description appears on pages 658-660. Eighteen locomotives of very similar design are being supplied by Birmingham to the Scottish Region, but will weigh only 74 tons instead of 77½.

Mr. F. E. Campion

ON November 30 the Southern Region of British Railways will lose the services of Mr. F. E. Campion, a Chief Civil Engineer of wide experience, remarkable organising ability, and unostentatious steadfastness. As one of his former colleagues writes: "Campion is a man of complete integrity, of quick and firm decisions, with a keen sense of justice, and is an exceedingly good leader, always commanding the confidence of his whole staff from highest to lowest."

He has inherited a talent for railway civil engineering. His grandfather, at the time of his death in 1890, was District Engineer, Derby South, on the Midland Railway. His father, after serving as Chief Assistant Engineer of the Great Northern Railway at Kings Cross, was Chief Engineer of the Great Northern Railway of Ireland. His biography on another page shows the scope of his earlier experience.

One of his first major tasks after appointment as Chief Civil Engineer of the Southern Region was to deal with exceptional damage by flooding. Early in 1953 the Kent Coast main line was put out of action by tidal flooding for a considerable period. Some 1¾ miles of it were damaged. Long lengths of track were washed out and constantly liable to re-flooding until protection could be provided by a new wall of chalk carried over 60 miles from Knockholt and from Manston.

About this time also a decision was taken to renew in aluminium alloy the trusses supporting about 200 ft. of the arched roof of London Bridge Station. This novel feature obviated the necessity for costly erection gantries, as the old trusses were used for raising the light new ones. The planning of the extensive Kent Coast line modernisation works and several of the bridge reconstructions—described in four of our issues in 1956—were occupying Mr. Campion's attention in the mid-50s. Meanwhile, several important stations were being re-built or redesigned, and re-laying with long-welded rails was approved and carried out on various sections of line. A number of tunnel and other formation drainage works became necessary, and new diesel, goods and other sheds had to be designed and built.

Then followed the Southern Region's blackest of years, 1957. In April, the fire at Cannon Street signalbox caused complete, if temporary, disorganisation of services in the south-east London area. Immediate and drastic improvisation was forthcoming from all departments including the Civil Engineer's. This was followed in December of that year by the disaster at St. Johns, Lewisham. This called for an instant and bold decision by Mr. Campion to replace the damaged and half-fallen through-truss skew overbridge by a temporary structure while rescue work was still in hand. A multiple R.S.J. span supported by a special steel trestle on new concrete foundations was designed and erected in a remarkably short time. Some 300 ton of steelwork was cut up and removed in 50 hr. by 150 men working in three shifts, 150 ton of concrete was placed in three days, and the steelwork was erected in two week-ends. The bulk of the work was done under traffic.

This responsibility was undertaken at a time when the Kent Coast modernisation works, outlined in our issue of February 28, 1958, were getting into full swing. Also at this time preparations were being made for the remodelling of Cannon Street Station and approaches, including the removal of the lofty all-over arched roof trusses. This delicate work is now rapidly nearing completion under exceptional conditions, the approval of and responsibility for the method and massive equipment used being one of his final tasks.

Only through the continuous efforts made under great difficulties for the last seven years or so, are payment by results schemes now working successfully, not only in the Southern, but in other Regions of British Railways. It is largely because of Mr. Campion's thoughtful and tactful approach to the problem that the co-operation essential to the success of the schemes has been obtained from all grades of railwaymen concerned.

Keeping the Railways Up to Date

THE ability of a modernised railway system to provide the community with an essential service was one of the points made in a vigorous defence of the British Railways modernisation plan by Sir Brian Robertson, Chairman of the British Transport Commission, in Sheffield last week. He was speaking at a dinner given by the Commission during a tour of the Sheffield-Leeds area, where his audience included many industrialists who consign and receive large tonnages by rail and road. Railways, he stressed, were not an outmoded form of transport, even although British Railways were "out of date thanks to a long period of neglect." He was thinking no doubt of the period between nationalisation in 1948 and the launching of the modernisation plan in 1955. In France, Western Germany, and Italy, as he pointed out, further large sums are being spent to extend the progress already made by the railways. The vital necessity for the economic life of this country of an efficient railway system is known to all large-scale users of freight transport and to all concerned with the movement of large numbers of people to and from work or on holiday. Some of the most obvious and most quickly remunerative examples of modernisation are the diesel railcars and multiple-unit trains now running in many parts of Britain. Sir Brian Robertson could draw the attention of his audience to the success of those working in the Sheffield district, of which more are to be provided in 1959. As an example of the benefits to be derived from further electrification, he cited the increase of over 50 per cent in receipts since electrification of the Sheffield-Manchester line. With improved techniques, increased receipts and substantial operating economies and reductions in running times may be expected from the conversions at 50 cycles to be undertaken as a modernisation measure. (The Sheffield-Manchester electrification was planned before the war, and completed before the modernisation plan was launched in 1955.)

The improvements in goods services such as those which will result from better marshalling facilities and operation of many more braked goods trains, will take longer to produce results. The railways are suffering from a serious fall in freight receipts as a result of the present recession in industry. Because of this, as Sir Brian Robertson pointed out, the opportunity is being seized in some quarters to urge a reduction of the large sums spent on modernisation, and to suggest that the forecasts of the ultimate benefits are unrealistic. The sums, as Mr. A. B. B. Valentine, Member of the Commission, recently showed are not great compared with what is being spent on the roads. Study of the economies sought, and of what already has been achieved, show the forecasts to be conservative and, we believe, realistic.

There is no question of spending money on the railways and then bringing pressure, other than that of choice because of its efficiency, on transport users to consign by rail. The declared policy of the Government is freedom of choice for the transport user. In nationalised transport, the Commission, as its Chairman emphasised, does not try to persuade people to send traffic by rail which could better go by other means.

Growth of Sydney Suburban Electrification

BY reason of its extent and traffic density the Sydney Suburban Electric System of the New South Wales Government Railways is prominent among such Commonwealth undertakings. Due to its constant growth it is not easy to give the exact route-mileage today, but the latest figure available is 128 miles. Worked on the multiple-unit overhead-supply system, an appreciable proportion of this mileage is four- and six-track, and 3¾ miles are underground beneath the city. Inauguration of the electric working celebrated its 32nd anniversary on March 1, 1958. A brief description of the operating and other features of this suburban system is the subject of an article elsewhere in this issue, containing a map likely to assist in identifying individual sections, and in following the expansion of its electrification outlined below.

By the end of 1926, the whole of the Sutherland and National Park line, running for about 15 miles southwards from the city, had been converted for electric traction, and the Sydney Central-St. James underground section had been completed with similar equipment. In the following year the 11-mile Bankstown branch leaving the Sutherland line at Sydenham was electrified, its trains working through Central to and from St. James Station. Then July, 1928, saw the completion of the wiring of the North Shore Line from Milson's Point—now just north of the Sydney Harbour Bridge—and proceeding to Hornsby; at that time this was an isolated electrified section. It remained so until June, 1929, when electrification was extended to the Northern Line, from Strathfield, on the main suburban (western) line, via West Ryde to Hornsby.

During that year also Liverpool, 22 miles out on the main line to Albury, joined the electric suburban system, when the section from Granville on the western line was wired. Moreover, a chord from Lidcombe, on the Western line to Paramatta on the Granville-Liverpool section was opened for electric working in that year, and the Warwick Farm Racecourse branch also became available for electric trains. It was in 1929, moreover, that several of these services were diverted to the new Central Station; a busy year all round. The section of the East Hills Line as far as Kingsgrove was completed as an electric branch in 1931; it was extended to East Hills in 1939.

1932 was another important year in the progress of the electrification and of extension of the scope of the system. In it the western section of the city underground line and the linking up of the North Shore line with it were completed by the opening of the Sydney Harbour Bridge and the links on both sides of it, that at Wynyard completing the through connection. This drastically changed the flow of traffic between the North Shore, the city, and the Central and other stations beyond it. Apart from electrification of the Bankstown-Regents Park link in 1937, there was little progress of importance until 1939, when the new line was completed to Cronulla from Sutherland, a valuable addition to the system, and the East Hills extension was opened.

Post-war developments have included the expansion of the electric suburban system to Penrith, 34 miles from Central, in 1955, and the completion of the vital underground link between Wynyard and St. James via Circular Quay in 1956, to close the underground loop and facilitate circular running from and to Central.The extension of the western main line electrification was completed to Lithgow, 97 miles from Sydney Central, on June 22, 1958. Though the section beyond Penrith is not in the suburban area, suburban multiple-unit trains can, on special occasions, be worked beyond Penrith, as the fixed electrical equipment is the same on both sides of Penrith, namely 1,500 V. d.c. overhead. Apart from local improvements south of Central, extension of multiple tracks, and new electric links in the Clyde area, the most important works in hand are in connection with the 9-mile extension of electric traction from Hornsby northwards to Gosford; the 10-mile section Hornsby-Cowan is expected to be completed in November, 1958. This will complete the suburban electrification northwards, but Northern main line electrification will be carried further to the Hawkesbury River by May, 1959, and to Gosford by December, 1959.

C.I.E. in 1957-58

WE have received from Dr. C. S. Andrews, Chairman of Coras Iompair Eireann, a copy of his board's report for the twelve months ended March 31, 1958. During the period covered by the report, the Chairman of C.I.E. was Mr. T. C. Courtney, who resigned on September 1, 1958, when the board was reconstituted in connection with the acquisition by C.I.E. of the assets, in the Republic of Ireland, of the Great Northern Railway Board. Mr. Courtney remains a part-time Member of the board.

—	1956-57	1957-58
	£	£
Railways—		
Passenger receipts	2,795,631	2,798,174
Goods receipts	3,915,442	3,739,050
Miscellaneous receipts	50,575	50,462
Total receipts	6,761,648	6,587,686
Expenditure	7,775,315	7,557,871
Loss	1,013,667	970,185
Road Passengers		
Receipts	5,546,948	5,480,974
Expenditure	4,946,598	5,123,140
Net receipts	600,350	357,834
Road Haulage—		
Receipts	1,707,777	1,741,887
Expenditure	1,643,746	1,694,131
Net receipts	64,031	47,756
Canals, loss	59,625	69,058
Docks & Harbours, loss	8,556	10,471
Hotels, Refreshment Rooms & Restaurant Cars, net receipts	38,288	40,228
Total loss	1,723,209	2,260,944

A total loss was incurred of £2,260,444, compared with £1,723,209 for the preceding year. Despite reduction in expenditure on the railways, of £277,000 before provision for depreciation, the loss on railway working was less than that for the previous year by only £43,000. This is attributed mainly to a reduction in receipts of £170,000. There was little change in passenger receipts. Expenditure on fuel on the railways was lower by £300,000. Although this reflected a slight reduction in price and in mileage run, it was the result mainly of introducing more diesel motive power units. At March 31, 1958, the staff of all C.I.E. undertakings totalled 19,554, or 216 less than a year previously.

A decline in first class passenger traffic on the railways, the report states, is probably due to a transfer of passengers to second class either as a matter of personal economy or because of the improved standard of travel comfort provided in second class. Excursion traffic declined in receipts and in the numbers conveyed, compared with 1956-57. The continuing increase in the number of private motorcars and the steadily expanding self-drive car organisations, the report comments, " affected not only established railway passenger traffic, but have absorbed much of the additional traffic which has developed in recent years with the growing public interest in travel." The decline in goods traffic included a 20 per cent drop in the carriage of beet and considerable shrinkage in livestock traffic. A reduction in cattle traffic was caused by a fall in demands from Great Britain and by increased use of private road transport.

Fifty-one diesel locomotives placed in service during the year were: five " B " class 960-h.p. diesel-electric, 218 " C " class 550-h.p. diesel-electric, and 18 " E " class 400-h.p. diesel-hydraulic. By March 31, 1958, all except three of the diesel locomotives ordered had been delivered. Fifty-four non-bogie parcel and brake vans and 10 non-bogie post office vans were placed in service during the year. The output of 1,156 new wagon stock included 805 open and 331 covered wagons.

Signalling developments included experimental non-token working in the Clonsilla-Leixlip block section and conversion of stop signals at level crossings to distant signals interlocked with gates. The Matisa ballast tamper

completed a programme of 57½ miles and Thermit welding of rails was carried out on eight miles of track. Production of pre-stressed concrete sleepers on an experimental basis was continued; 11,000 sleepers were manufactured at the C.I.E. pre-cast concrete sleeper works at Inchicore, and put into the track. Work on the provision of additional passenger and operating facilities at Dun Laoghaire was completed in June, as described in our issue of October 18, 1957.

An encouraging feature was the increase in receipts from hotels, refreshment rooms and restaurant cars. Twelve buffet cars were reconditioned.

Electrification Systems

THE progress being made by British Railways with its 25-kV. a.c. electrification programme gives added interest to a paper by Mr. R. Ledger, Traction Motor Department, General Electric Co. Ltd., Witton, on some aspects of railway electrification read at the 33rd annual joint meeting between members of the Association of Supervising Electrical Engineers and the Institution of Engineers-in-Charge last week. As a result of the adoption by British Railways of the 25-kV. system for practically all future railway electrification in this country, the British electric traction industry, which has up till now been concerned almost exclusively with d.c. traction, is faced with the development of motive power and equipment for the new system.

Mr. Ledger states that the widespread use of d.c. traction is due entirely to the fact that the d.c. motor is undoubtedly the best type of machine for the application, having none of the inherent faults of the a.c. traction motor. However the advantages of using a simple, reliable, and efficient motor are off-set by a more costly distribution system and by certain disadvantages due to the fact that speed control must be by a combination of series resistances, field diversion, and variation of the number of motors connected in series. As a result the number and range of running speeds which can be provided on d.c. locomotives and motor coaches is restricted as compared with a.c. equipments.

A much more important disadvantage of this method of control is its adverse effect on adhesion, the magnitude of which has only recently been fully realised. Such quantitative results as are available indicate that, whereas a six-motor d.c. locomotive would be required for the heaviest duties in this country, these should be within the capacity of a four-motor a.c. locomotive.

The maximum practicable d.c. contact line voltage is 3,000, and, therefore, a relatively large number of rectifier substations, with an a.c. distribution network and complex remote control system is necessary. Also, the contact line itself must be capable of carrying fairly heavy currents as a 300-h.p. 3,000-V. locomotive will take about 900 A. at its continuous rating and about 1,800 A. peak current.

On the other hand, as he points out, the voltage of an a.c. contact line is not limited to a value determined by motor and switchgear design considerations, and so the most economic voltage from a distribution point of view can be employed. In general this is about 25-kV., although in this country 6·25-kV. is being used where sufficient clearance for the higher voltage cannot be economically obtained. On passing a point where the voltage changes the transformer connections on the train are automatically changed by track magnets and a receiver similar to that used for the A.T.C. system.

Although it has been used on experimental equipment, Mr. Ledger considers that the multi-anode rectifier as used in substation practice is too bulky for general use on rolling stock and is not suited to bridge connection. It has, therefore, been necessary to develop single-anode types of much smaller dimensions. Both excitrons, in which the arc is maintained continuously by an auxiliary anode, and ignitrons, in which the arc is struck at each cycle from an auxiliary anode fed by a firing circuit are used.

Some equipments are now being built with germanium semi-conductor rectifiers, but this material has the disadvantage for traction work of a low maximum working temperature and small overload capacity. There is undoubtedly great promise for the semi-conductor rectifier with its simplicity and lack of auxiliary equipment, but it is considered that this lies with silicon rectifier rather than germanium because of their higher temperature limit.

As regards the overall picture he considers that the new system, in the case of rectifier equipments, brings together for the first time in a practical form the best features of the a.c. and d.c. systems, namely the high voltage a.c. distribution system, variable voltage control, and the d.c. motor, but this is done at the expense of considerable additional equipment on the rolling stock. Furthermore, in this country, the provision of adequate clearance for a 25-kV. overhead system is not easy, and, as a result, long stretches of line in built-up areas and through tunnels are to be supplied at 6·25 kV. This further complicates the rolling stock equipment as automatic devices must be provided for selecting the correct transformer primary connections according to the overhead line voltage.

Improving the L.T. & S. Line

NOW that work has started on the installation of the overhead contact wire, a significant stage has been reached in the electrification of the London Tilbury & Southend Line of the Eastern Region of British Railways. The modernisation scheme for the L.T. & S. line provides for the introduction of electric traction on the 25-kV. 50-cycle a.c. system over nearly 80 route miles, covering the lines between Fenchurch Street and Shoeburyness, Barking and Pitsea via Tilbury, and between Upminster and Grays. The cost of this work, originally put at £25,000,000, will probably be nearer £30,000,000 when completed in 1961.

Although wiring has only just begun, work has been in progress for some time on several civil engineering projects prerequisite for electrification. The complex reconstruction scheme at Barking, described in our issue of March 21, is undoubtedly the principal major work, and involves the construction of two flyovers and a dive-under, new buildings at Barking Station, and a new signalbox to replace existing boxes. Completion of the scheme will enable more trains to be run, and with greater punctuality. The flyover will eliminate crossing movements of freight trains; result in better freight services; and improve public facilities through the station. This is only one aspect of the civil engineering work which also includes the reconstruction of many overline bridges to provide the necessary overhead clearances, installation of colour-light signalling, and the construction of stabling facilities for electric stock.

All this reconstruction has necessitated the replacement of five existing marshalling yards by one new yard at Ripple Lane. This is planned to improve generally the working of freight traffic in the area by the provision of a modern mechanised hump yard with primary and secondary retarders. The outstanding feature of the new yard is the provision of direct access to the reception sidings for both up and down traffic. Ripple Lane was the first yard designed to incorporate this facility and the design has since been applied to other new yards.

Apart from engineering work, construction of the multiple-unit stock is also in hand. There are to be 112 four-car sets, each set seating 363 passengers. Trains will be made up of one, two, or three sets. The coaches will be used initially on the Liverpool Street to Shenfield, Chelmsford, and Southend services when the supply to this section has been converted to 25 kV. while the existing d.c. stock is converted for operation on the a.c. system. The overhead line equipment itself is of simple construction and consists essentially of a copper catenary which supports, by droppers, a copper contact wire. The total length of catenary and contact wire required by the L.T. & S. electrification will be about 350 miles.

Completion of the work in 1961 will not only afford substantial economies in operating, but also allow a greatly improved service to be operated. This in turn should set new standards of passenger comfort on the L.T. & S. line.

The Recession in Freight Train Traffic

(*By a correspondent*)

SINCE the setback to railway freight traffic was discussed in the October 31 issue of *The Railway Gazette*, ample publicity has been given to the serious financial position of British Railways as at September 7. No. 10 of *Transport Statistics* shows that there was no improvement in the next four weeks to October 5. Merchandise (including livestock) tonnage at 2,773,000 was 438,000 below 1957 (13·6 per cent), while receipts were £1,268,000 less (15 per cent). Mineral forwardings of 3,681,000 tons were down by 1,372,000 (27 per cent) and produced £1,137,000 less revenue (also 27 per cent). Coal and coke accounted for 10,921,000 tons, 1,095,000 fewer than last year (9 per cent) and yielded £1,037,000 less in dues (10 per cent). As the saleable output of coal increased by 560,900 tons, or 2·7 per cent, in five weeks to October 10, the fall in rail carryings was disappointing. The tonnage originating in the four weeks totalled 17,375,000, a decrease of 2,904,000 tons, or 14 per cent, from 1957; the resultant revenue was lower by £3,442,000, or 15 per cent.

Normally the 10th period of the year would have started the season of large traffic loadings. The extent of this year's setback can be judged from a comparison with the same four weeks of 1953, when the railways handled the largest tonnage in any year since 1948. This year 5,498,000 fewer tons were put on rail. That was a 24 per cent fall resulting from a 30 per cent drop of 1,195,000 in merchandise originating, a 25 per cent decrease of 1,274,000 in minerals and a 21 per cent decrease of 3,029,000 tons in coal and coke.

Ton mile statistics for the 10th period show that the amount of work done by the railways is shrinking rapidly. They worked 179 million fewer ton-miles this year than in 1957, a decrease of 11 per cent. That is bad enough, but compared with 1953 freight movement declined by 440 million ton miles, or 24 per cent. Of this loss of traffic volume, merchandise was responsible for 142 million ton miles, minerals for 90 million and coal for 208 million.

The figures quoted above suffice to prove that the predicament of the railways is not due mainly to reduced activity in iron and steel industries. Merchandise tonnage has declined persistently from 56 million tons in 1948 to 42 million in 1957, less than the quantity handled by the old railway companies in 1933, when industrial depression was widespread. In that gloomy year mineral traffic dropped to 43 million tons; British Railways were fortunate to see it rise from 59 million tons in 1948 to over 65 million tons in both 1956 and 1957. Coal class tonnage was less dependable, advancing from 158 million in 1948 to 175 million in 1953 and then falling to 167 million tons last year, only 2 million tons above the 1933 figure.

The advance statement for the four weeks to November 2 reports a further decrease of £3,677,000 in freight train revenue. Receipts from merchandise were down 14 per cent, from minerals 21 per cent and from coal nearly 14 per cent. Evidently the sharp decline in all classes of traffic continued. The general nature of the fall in traffic volume upsets the notion that the sudden drop in mineral and coal traffic is the main cause of the present position. A ton of merchandise earns three times as much revenue as a ton of heavy traffic. The railway modernisation plans concern the securing, handling, and conveyance of merchandise more than the haulage of minerals and coal. If present trends endure much longer, there will be an insignificant amount of merchandise to pass by rail, on any system, ancient or modern, in relation to the expansion of the national economy.

LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of Correspondents*)

Manchester-Sheffield-Wath Electrified Lines

November 22.

SIR,—On March 8, 1957, you published an article which showed the need for a full report on the results of electrifying the Manchester-Sheffield-Wath lines. That was the first scheme carried out in this country for electrifying a section of main line, which carried a heavy freight traffic over a difficult route. Precise information about this project would have been useful, but the British Transport Commission did not mention it in either the 1956 or 1957 annual reports and ceased to furnish particulars in *Transport Statistics* of traffic movement on the electrified lines.

On a recent visit to Sheffield, the Chairman of the Commission, Sir Brian Robertson, stated that since electrification, revenue from the line to Manchester had gone up by over 50 per cent, and he claimed the increase as evidence to support forecasts of the success of modernisation. What matters at the present crisis in railway affairs is net revenue on a full cost basis. We ought to know the return which British Railways are earning on the extraordinary expenditure incurred by the changeover to electric operation.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1

Design of Diesel Locomotives

November 16

SIR,—Mr. John Rodgers, in his letter in your November 7 issue, suggests brake tenders as the solution of British Railways braking problem. This answer would have the merit of also applying on the 25-kV. a.c. lines for which 80-ton Bo-Bo locomotives are on order. The 2,000-b.h.p. B-B diesel-hydraulic locomotives of the Western Region would require extra "brake weight," should they be hauling very heavy unfitted freight trains.

If brake tenders are unacceptable, perhaps the A1A-A1A wheel arrangement would be better than Co-Co. Traction motors and control equipment could then be the same as for a Bo-Bo locomotive. By designing the A1A-A1A and Bo-Bo classes simultaneously, all working and wearing parts could be identical, much simplifying the spares position. Early deliveries would be A1A-A1A and, once freight trains are fully braked, Bo-Bo. Similar considerations would apply to a diesel-hydraulic locomotive and its drive-splitting and final-drive gearboxes. Such a solution would not stop the A1A-A1A machines carrying 36 tons of unnecessary weight for 20-odd years; that is, a loaded passenger coach!

Yours faithfully,

D. J. MANTON

Cotswold, Evelyn Way, Stoke D'Abernon, Surrey

Clean Trains

November 13

SIR,—The editorial article in your issue of October 31, while giving a fair appraisal of the position, reaches only that section of the public who are interested in railways and who are already fully aware that the trouble is caused by the "unpleasant behaviour of some of their customers." I hope your article will be reproduced in other publications more likely to reach the general public.

Much litter could be avoided by providing a suitably shaped bin in those coaches with transverse corridors or with doors only at the ends. A small bin could easily be placed under the window. It might also help if these bins bore a suitable request, such as "Please put your litter in here and help to keep your trains clean."

Yours faithfully,

F. W. HARVEY

54, Hinton Way, Great Shelford, Cambridge

THE SCRAP HEAP

Last of a Dublin Terminus

The news that Harcourt Street Station is to be closed on January 1 will bring a reminiscent flash to the raconteur's eye. The smallest of Dublin's railway stations, it was built just 100 years ago "so that," as *Punch* remarked, "Percy French could make his famous remark about it." The station looks rather like a bijou Acropolis, so much so that on a day in 1900 a confused engine driver lost his bearings completely and drove his train through the end wall into Hatch Street.

Should there be any need to further emphasise Harcourt Street's status as a terminus, its travelling arrangements prove it beyond all doubt. Trains pull into No. 1 Platform—and pull out from No. 1 Platform. There is, in fact, only No. 1 Platform. The far side of the station presents a blank wall, its bareness meagrely swathed in travel posters. Which brings us to Percy French's remark. "There are two sides to everything," he said, "except Harcourt Street station."—*From "The Manchester Guardian."*

Footplate Working

This place is a stretch of nowhere, midway between Newcastle and Edinburgh. Only two men are here—and here is the footplate of a night express train tearing hell-for-leather towards Scotland. . . . Norman McKillop consults his big turnip watch. Right on schedule. He glances at the steam pressure gauge. Twenty-five pounds to the square inch. Just right. Things couldn't be better. He and his fireman exchange a wink of well-being. And that wink is prettly nearly the last wink that either of them is to wink. For, with a roar like a thunderclap, a solid wall of flame shoots out of the firebox and fans back halfway over the long tender behind.

Simultaneously, they leap for the corner of the boiler end, and, in less time than their wink took, they have whanged the blower on, jammed shut the throttle, and brought the second injector into action. Disaster has been averted. The searing flames are bottled up.

But, with the throttle shut, Norman McKillop's train can't go. If he opens it, he will again expose himself, his fireman, and his passengers to grave danger. He cannot do that. But equally he cannot strand an express train in the middle of the night and miles from its destination. . . . He directs his engineer to stoke up the fire and get clear of the cab. Then, leaning his whole body out of the window, he opens the death-dealing throttle to get the necessary speed up.

The flames burst forth and lick about his legs—the only bit of him still inside the cab. He bears the monstrous heat as long as he can, then shuts down the throttle again and lets momentum take over.

Repeating this action again and again, he inches his train over a steep grade, then coasts down into Tweedmouth, where the faulty engine is replaced.—*From "The Sunday Express."*

New Lease of Life

The steam locomotive shown in the accompanying illustration was purchased by the Demerara Bauxite Co. Ltd., Georgetown, British Guiana, in 1926 for hauling bauxite to the plant. When it was finally removed from locomotive service in 1946 it was adapted for use as a steam boiler for additional power generation at the plant and is still in service in this capacity.

Steam, Electric, Diesel . . . ?

A special ballot on a subject of romantic importance is being arranged by . . . the Institution of Civil Engineers. At its traditional Christmas lecture on December 29, Mr. L. T. C. Rolt is speaking on peculiar railways to an audience of probably 800. It is supposed to be juvenile, but many fathers have already asked for tickets. The children will be asked to say which engine they prefer—steam, electric, diesel or gas turbine.

Their answers will not, I gather, affect the modernisation programme of British Railways. But on the assumption that the child of to-day is the fare-paying passenger of to-morrow, the ballot may not be unimportant.—*"Peterborough" in "The Daily Telegraph."*

Railway Earnings Rising (1898)

It is eminently satisfactory to find that, notwithstanding labour disturbances at home and the blighting effect of foreign crises on our international trade, railway earnings still keep on the upgrade. For the week ended on the 13th instant the traffic receipts of 33 of the principal lines in the United Kingdom amounted to £1,668,217—an advance of £75,984 on the corresponding week of 1897. For the half-year to date the aggregate takings have increased by £2·2 million over the same period last year. How far these gains will be reflected in the net earnings is, of course, another story, but, so far as they go, they make a capital showing.—*From "The Financial Times" of November* 19, 1898.

Photo] *[Demerara Bauxite Co. Ltd.*

Old steam locomotive, "Lord Manly," being used as a steam boiler for power generation at the plant of the Demerara Bauxite Co. Ltd. British Guiana

Forewarned

They're lagging the pipes at the station
And, with other portents in mind,
It's clear, as the autumn days shorten,
That winter can't be far behind.

The dawn sometimes has icy fingers
And rime on the rails seems to say:
"Take warning from me, all you people,
Cold snaps will be here any day."

And, maybe, our old friends, the fog-men,
With visions of long, chilly nights,
Are wishing that "they" would press on with
A.T.C. and/or more colour-lights.

But we, who snug down by the fireside
Or get warm by twiddling a knob,
Are cheered by those bangs in the distance,
Content that someone's on the job.
They're lagging the pipes at the station;
I wonder, when all's weather-proof,
If there'll be anv odd bits left over
To stop up the holes in my roof!

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

VICTORIA

Better Riding with New Bogies

The riding of sleeping cars on the night trains between Melbourne and Mildura is being improved by fitting new bogies at Newport Workshops to the air-conditioned sleeping cars. Similar bogies have been successful on the all-steel, air-conditioned sleeping cars of the "Overland" between Melbourne and Adelaide. They were also fitted to one of the State cars of the Royal Train in which Queen Elizabeth, the Queen Mother, travelled to Ballarat on her visit to Victoria this year.

The helical springs in the bogie are designed so that the difference in height between the free and loaded condition of the car is relatively large. All parts are readily accessible for inspection and maintenance.

AUSTRALIA

Diesel-Hydraulic Locomotives

The first two of six diesel-hydraulic locomotives ordered by the Commonwealth Railways left Sydney recently on a 1,300-mile journey to Port Augusta in South Australia. They are the first diesel-hydraulic locomotives to be made in Australia and were built in Sydney by the Clyde Engineering Co. Pty. Ltd. They are to be used mainly for shunting operations on the Commonwealth system and are equipped with 625-h.p. six-cylinder Maybach diesel engines and can haul 1,000 ton at 5 m.p.h. and reach a speed of 53 m.p.h.

The total weight is 45 ton with an axle load of 15 ton and 0-6-0 wheel arrangement. Wheels are directly driven through a torque converter and automatic transmission. Starting tractive effort at 30 per cent adhesion is 30,200 lb. and continuous tractive effort 29,000 lb. at 5 m.p.h.

The new locomotives hauled freight over the New South Wales standard gauge lines from Sydney to the Victorian border where they were transferred to 5-ft. 3-in. bogies for the journey via Melbourne and Adelaide to Port Pirie Junction in South Australia. There, standard gauge bogies were refitted for them to proceed over Commonwealth Railway tracks.

NEW ZEALAND

Pay Increases

Some 25,000 railway employees will receive pay increases as a result of an order issued by the New Zealand Railways Industrial Tribunal. Only administrative class officers, those with salaries in excess of £1,340 a year, will not benefit. The Tribunal's order is noteworthy in that it applies to many hundreds more salaried employees than covered in the Government claim. Total cost of the increases will be more than £400,000 a year.

South Island Train Alterations

Elimination of the local passenger train service from Ashburton to Christchurch and back is one of the main features of alterations to local services in the South Island. Most local traffic in this area is now catered for by road services. At Dunedin the local mixed train service, Mondays to Fridays, from Palmerston to Dunedin and back has been replaced by a railcar, except for the Friday evening service from Dunedin, which continues to be provided by vehicles attached to a goods train. The railcar makes the 40-mile run between Dunedin and Palmerston, stopping at all stations, in 95 min. down and 100 min. up compared with 2½ hr. by the mixed trains.

SOUTH AFRICA

Ballast Quarrying at Coegakop

More than 4 ton of gelignite was used at the railway quarry, Coegakop, 14 miles from Port Elizabeth, recently, to blast out some 35,000 ton of rock for ballast purposes. This was the biggest single quarry blast ever staged by the South African Railways.

Because drilling in the highly abrasive quartzitic sandstone causes a high loss of drill steel even when tungsten carbide-tipped steel is used, the "heading" or "coyote" system of blasting, which consists of large charges of explosives placed in the rock at predetermined intervals, was selected. In this way the most efficient use of the explosive was ensured.

The Coegakop quarry produces about 9,000 ton or 6,000 cu. yd. of ballast a month. South African Railways control nine large quarries throughout the Union and South West Africa. In tonnage of departmental traffic hauled, the crushed product is second only to locomotive coal. Over 400 special "Y" type bogie wagons for the conveyance of ballast have been put in service, but it is still necessary to divert more than that number of other suitable vehicles from revenue-earning traffic to haul the ballast output.

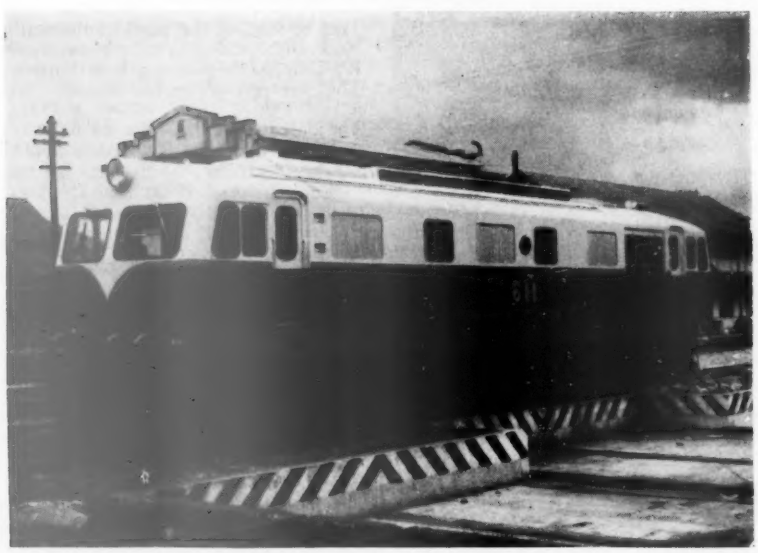
UNITED STATES

Future of Grand Central Terminal

As an alternative to ceasing all operation into and out of New York City, which has been threatened by the New York Central System owing to the excessive taxation of Grand Central Terminal and its approaches, the N.Y.C. President, Mr. Alfred C. Perlman, has made a new proposal to the city. It is an offer by the railway to turn over to the city 5·2 miles of its tracks, including stations, signalling, and other facilities, from the Harlem River Bridge into Grand Central, where the offer includes all those parts of the station devoted to "commuter" suburban traffic. The goods tracks on the west side of Manhattan Island would not be included.

The N.Y.C. would continue to use

Diesel Traction in Thailand



950-b.h.p. diesel-electric locomotive built for the State Railway of Thailand by Hitachi Limited, Japan

the tracks under Park Avenue for its long-distance main line and outer suburban train services, but maintenance and operation of these lines would be the responsibility of the city. It is suggested by the railway that a link at Grand Central between the existing N.Y.C. suburban lines, on the lower level, and those of the I.R.T. Lexington Avenue rapid transit subway, would make possible an extension of the existing N.Y.C. suburban services through to Lower Manhattan. It is estimated that acceptance of the New York Central plan would save the railway $6,500,000 annually in taxes.

BRAZIL

Developments in Railway Industries

Companhia de Material Ferroviario Cobrasma has received two Export-Import Bank loans to expand production. The company holds licences from several American firms, including the Budd Company, of Philadelphia, to manufacture its rolling stock and other equipment. It is at present building stainless-steel passenger cars, exporting couplers and other material to Argentina, and installing plant to forge wheels, axles, and so on.

Another rolling stock manufacturer, Sorocabana de Material Ferroviario, associated with General American Transportation Corporation, of Chicago, specialises in tank and refrigerator wagons. It has recently developed new business in leasing, instead of selling, its wagons to bulk transport companies and has installed several maintenance shops in Southern Brazil to repair its own rolling stock and that of the railways.

Fuel Consumption

The replacement of the 2,137 steam locomotives, with 30 to 60 years' service, by diesel-electric locomotives will effect considerable economies in fuel costs and valuable forest reserves. Wood must be brought from ever-increasing distances, inflating the cost. In 1957 the railways consumed 5,211,956 cu. m. of wood, causing the destruction of 77·2 sq. miles of forest. The biggest users were the Paraná-Sta. Catarina and Noroeste Railways, which consumed 1,343,438 and 1,014,944 cu. m., respectively. The former has received 25 diesel-electric locomotives this year, the latter 38. The Paraná-Sta. Catarina Railway reports that carrying capacity has trebled and revenue doubled since the new locomotives were put in service; compositions of 50 wagons are common.

PERSIA

Moscow-Teheran Link

Since the completion earlier this year of the railway from Teheran to Tabriz, the Iranian State Railways appear to have converted to standard gauge the section of line from Tabriz northwards to the Russian frontier at Djulfa, allowing a through train with sleeping and restaurant cars to work between Teheran and Djulfa. This now connects at Djulfa with a weekly through car to and from Moscow via Erevan, Sochi and Rostov-on-Don, allowing through rail communication between Moscow and Teheran.

FRANCE

Quadrupling Achères to Poissy

The Paris-Mantes via Poissy line of the Western Region carries, besides a heavy suburban traffic, many main-line trains. Except for a short length between Houilles and Achères, it is double track throughout. Although the double-tracked Paris-Mantes line via Conflans St. Honorine can be used, to some extent, as a relief for the Poissy line, the effect is limited, as the former is suitable only for lighter trains and is not practicable for most goods trains bound for the marshalling yard at Achères. Many multiple-unit suburban trains turn round at Poissy without adequate facilities being available there. To overcome these difficulties the S.N.C.F. has decided to quadruple Achères and Poissy, and to establish a third track at a bottleneck between Sartrouville and Maisons-Laffitte. Other works include modification of the layout at Poissy to give an extra terminal platform and three stabling sidings, the extension of the station and yard serving the Simca Works, and flyovers to carry the new slow down line under the Grande Ceinture and under the existing Paris-Mantes line.

HUNGARY

Passenger Traffic Increase

This year the railways had their busiest summer season, carrying a record number of passengers (74,100,000) in three months, 12 million more than in the corresponding period of 1957. Some 400 special trains were run, including 174 to holiday resorts around Lake Balaton. Unpunctuality is stated to have been reduced to 4 per cent of passenger trains, compared with 7½ per cent last year.

NORWAY

Saltdal-Fauske Opening

A further 39-km. (24-mile) section of the new Nordland Railway, from Saltdal to Fauske, will be opened to traffic on December 1, with a service of two passenger and one freight train a day. The remaining 63 km. (39 miles) from Fauske to Bodö are expected to be completed by 1962.

Publications Received

Lokomotiven und Wagen der Deutschen Eisenbahnen (German Railways Locomotives and Rolling Stock). By Dr.-Ing. Erhard Born. Heidelberg: Verlagsanstalt Hüthig & Dreyer G.m.b.H., Wilckenstrasse 3. 8 in. × 5¼ in. 180 pp. Illustrated. Price DM. 8.60—Besides a succinct history of the development of motive power and rolling stock on the many German railway undertakings from the earliest times, this book gives an admirable summary of present-day practices. The chapters on German diesel and electric locomotives, railcars, and multiple-unit trains are of special interest. The many photographic illustrations are well chosen and reproduced. They include many items of historical interest, especially some electric steam locomotives, and also recent developments, notably in diesel traction and goods wagon design. All the major historical features of German railway history are mentioned, including well-known steam locomotive designs on several State railways early in this century. A major defect is the omission of the names of the manufacturers. The bibliography lists many works in German.

The Railway Museum, York.—An attractive folder produced and distributed by the British Transport Commission draws attention to, and illustrates, some of the exhibits in the Railway Museum at York. A sketch map shows the way from York Station to the two parts of the museum: the Small Exhibits Section, and the Queen Street Section which houses locomotives and other heavy material.

Famous Cableways of the World. By F. E. Dean. London: Frederick Muller Limited, Ludgate House, 110, Fleet Street, E.C.4. 7½ in. × 5 in. 144 pp. Illustrated. Price 9s. 6d.—The use of cables for transport is described in non-technical terms. The chapters include one on cable railways, such as the Glasgow Subway (before conversion), the Cowlairs incline of the N.B.R., and the mountain section of the Santos-Jundiai (former Sao Paulo) Railway in Brazil, also funiculars. Other chapters are concerned with télépheriques, ropeways for freight, and the use of cables in bridging and other construction.

Winter Sports.—Centres in Austria, France, Germany, Italy, Jugoslavia (in the Julian Alps, in Slovenia), Norway, Spain (the Pyrenees), Sweden, and Scotland (Nethy Bridge) are included in the illustrated 80-page winter sports holiday programme of Thos. Cook & Son Ltd. and Dean & Dawson Limited. Useful travel information is included, such as brief notes on *couchette* and sleeping car accommodation on the Continent; the winter sports special trains arranged by Cooks and Dean & Dawson from and to the Continental ports are to include *couchette* accommodation for each passenger.

Rubber Rail-to-Sleeper Fastening

For use with flat-bottom rails, primarily on timber sleepers, and particularly with long-welded rails

(*By a correspondent*)

Cast-iron baseplate with jaws designed to fasten flat-bottom rails by metal-rubber wedges

A RAIL-TO-SLEEPER fastening at present on trial on British Railways is applicable to ordinary flat-bottom rails, but is specially designed to resist any tendency towards buckling in long-welded rails. Known as the Clyde Rubber Wedge Fastening, it has been designed initially for use with wooden sleepers but is being modified to suit other types. At present the Western Region is installing a ¼-mile length, the Scottish Region a ¼-mile length, and in the Eastern Region a 60-ft. length has already been installed.

The advantages claimed are: (1) simplicity, no special tools or skilled labour being required; (2) cheapness in first, maintenance, and replacement costs; (3) over-riding safety afforded; (4) sufficient elasticity to protect the sleepers against impact and so increase their lives; and (5) no interference with track-circuiting.

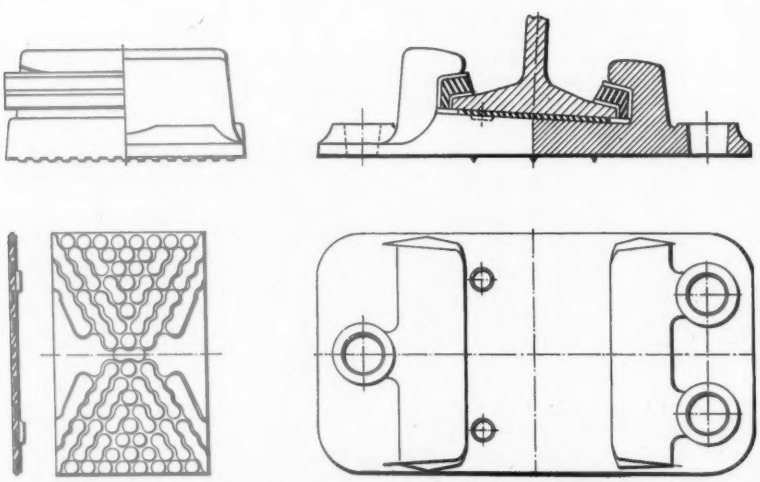
In certain respects the fastening resembles the familiar chair-and-key fastening for bull-head rails but has several obvious advantages over the latter. In fact, it consists essentially of a cast-iron baseplate enclosing a rubber pad upon which the rail-base is held securely both vertically, transversely and laterally by metal-rubber wedges fitting tightly into jaws cast integrally as part of the baseplate.

Driving and Extraction of Wedges

As the illustrations show, the wedges are slightly obtuse-angled in section and are parallel-sided. They bear on both the ends and tops of the toes of the rail, being driven and extracted with an ordinary keying-hammer and simple driving and extracting heads, very much as are bull-head rail keys. It will be noticed that the rail nowhere touches the baseplate, there being a resilient rubber pad and wedges between them. The baseplate can be secured to the sleeper as is a chair in any of the normal ways, with or without serrations of its base or other means of increasing grip. The driving of each wedge is calculated to exert both a downward and a horizontal thrust of 2 tons on the foot of the rail. The rubber base pad has been specially designed after long experience, which also dictated the use of natural rubber. The pad has two projections fitting into recesses in the baseplate that keep it in position.

It is the resistance to torsion in the rail, insuring that the latter remains a stiff horizontal girder, which makes this fitting so suitable to prevent buckling in long welded rails. Moreover, it is specially effective in resisting creep. Further advantages claimed are that the pre-chairing of the sleepers is possible, and the rail can be barred into the baseplate as is a bull-head rail into a chair. Also, lack of direct contact between rail and baseplate makes insulation more effective than usual.

Service of this wedge-fitting under heavy traffic and various climatic and atmospheric conditions on British Railways will be watched with interest.



Arrangement of rail fastening unit incorporating metal-rubber wedges and rubber pad

WITHDRAWAL OF PASSENGER FACILITIES FROM WARTHILL, FANGFOSS, AND CHERRY BURTON STATIONS.—British Railways, North Eastern Region, has announced that, because of the loss which is being incurred, passenger train facilities will be withdrawn from Warthill, Fangfoss, and Cherry Burton Stations, on the York-Hull line, from January 5. Approval has been given by the Transport Users' Consultative Committee for the Yorkshire Area. Bus services operate in the district. Parcels traffic by passenger train will be collected and delivered by British Railways road services operating from York, Stamford Bridge, and Beverley. There will be no change in freight traffic facilities.

Stewarts Lane Training School

Modern instructional techniques and equipment for potential drivers of electric and diesel-electric equipment on the Southern Region

One of the classrooms at Stewarts Lane

BY June next year, the first phase of the new electrification of the Southern Region of British Railways will have been completed. A further 140 motormen, 110 diesel-electric locomotive drivers, and 100 electric locomotive drivers will be required to operate the new equipment to be introduced under the Modernisation Plan.

Learning to handle a new form of traction represents an upheaval in a driver's life. When any new methods are introduced, there always must be a tendency to try to continue to use traditional ways, and this tendency must be resisted. Experienced men must gradually be led into the new techniques involved and the best use must be made of available skill, both in teaching and in student material.

Instruction at Stewarts Lane is an amalgamation of old and new.

Trainees are taken from footplate staff already thoroughly experienced in steam locomotion. The men absorb the new knowledge in graduated stages: A final examination shows whether this has been properly absorbed.

Practical Emphasis

Emphasis is placed on practice rather than theory. Very thorough instruction is given on the actual working of the new engines. Fault-finding forms an essential part of the courses.

Fault-finding is an aspect of railway work which tends to be forgotten through disuse when electric traction is operated because of the latter's reliability.

Two weeks' lectures in the classroom precedes one week of outside work. Stewarts Lane Training School is ideally situated for practical instruction. At present, actual physical work is being carried out in the near vicinity. In addition, a large new electric locomotive maintenance depot recently has been completed in the yard. For the future are the new depots for electric multiple-unit stock and diesel-electric maintenance now under construction at Stewarts Lane.

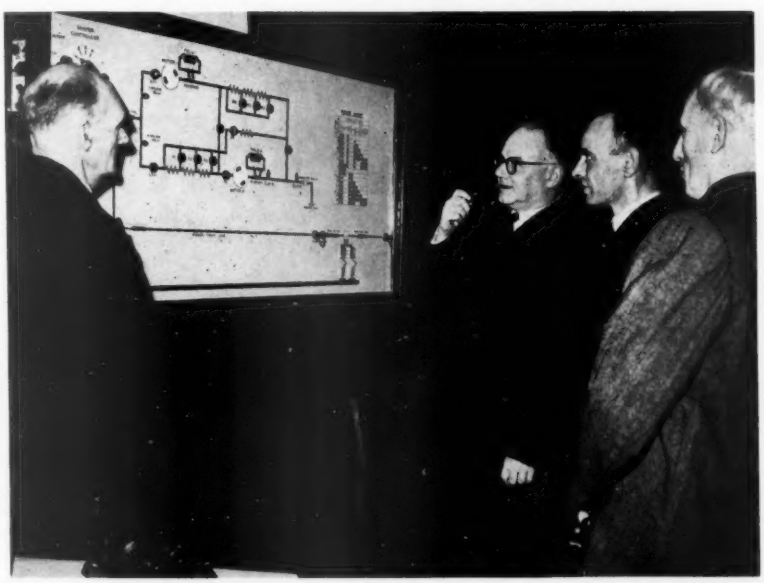
First-class equipment has been installed. Each of the three classrooms is furnished with a full-length blackboard, invaluable for protracted diagrams such as signalling layouts. Tables, not desks, have been provided for each student, and ample space separates each from the other. Every table has two roomy drawers to accommodate papers and small personal effects. This means that trainees can carry out their outdoor study uncluttered by portables.

Three - dimensional diagrammatic models with movable parts supplement wall-charts carrying clear expositions of the equipment with which students must become familiar. There is fault-finding layout and an epidiascope.

Accommodation

The school accommodates 42 trainees in three classrooms. It also houses a messroom and an instructors' study. Windows are large; lighting is diffuse and adequate, and the whole building is centrally heated. Interior walls are finished in green and cream.

Tuition, which is under the overall direction of Mr. G. A. Weeden, Motive Power Officer, on behalf of the Chief Mechanical & Electrical Engineer, Mr. W. J. A. Sykes, is in the hands of Mr. W. Brambles, Mr. J. McCarthy, and Mr. W. Oliver, all Locomotive Inspectors of the Southern Region. The new school has been planned as a permanent feature and will be the instructional centre for the whole of Regional classroom training in motive power subjects.



Inspector W. Brambles showing fault-finding layout to Mr. C. P. Hopkins, General Manager, Mr. G. A. Weeden, and Mr. W. J. A. Sykes

Sydney Suburban Electric Services

Their intensity, routeing, and equipment

THE Sydney Suburban Electric System of the New South Wales Government Railways today has a route-mileage of at least 128 miles, extending (*a*) westwards to the foot of the Blue Mountains at Penrith, 34 miles from the city; (*b*) northwards to Hornsby (21 miles) by two routes, the North Shore and Northern; (*c*) to Cronulla, a like distance to the south; and to numerous branch-line and other terminals mainly to the south west. On an average it carries nearly ¾ of a million passengers in its 21-hr. working day.

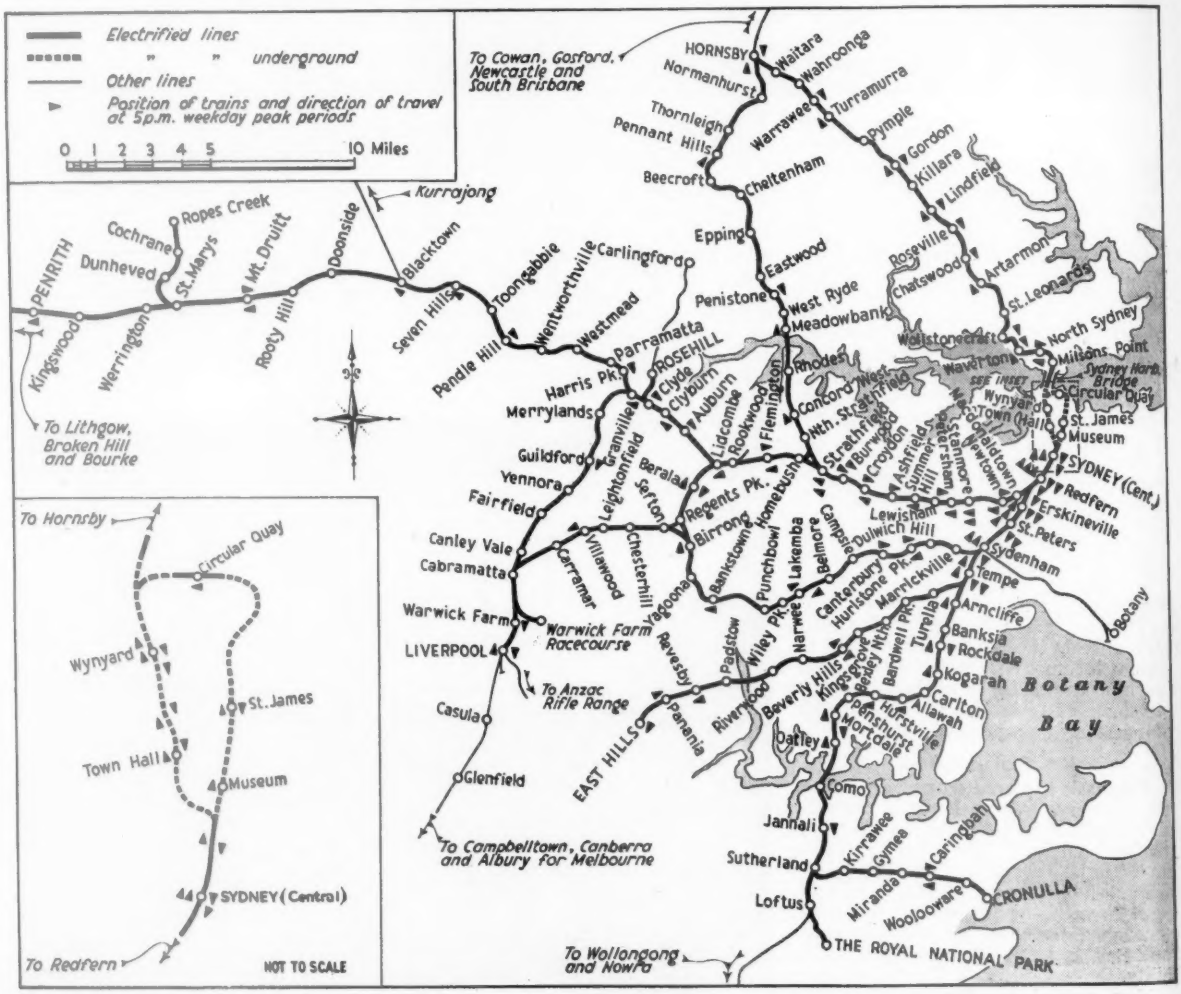
It is noteworthy that at 5 p.m. precisely, in the 4.30 p.m. to 6.30 p.m. homeward rush period, 122 eight-coach trains are in daily service, Monday to Friday, occupying the positions shown on the accompanying map. The densest traffic is naturally in the city area, no fewer than 126 trains traversing the 3¼-mile underground loop, Central-Circular Quay-Central, in the two peak hours. These are trains from the outer suburban areas running one or other way round the loop and proceeding again to the same or more often some other suburban area.

Inner Suburban Traffic Density

Apart from the underground section, the greatest traffic concentrations at 5 p.m. are (*a*) on the 10-mile multi-track section of the main (western) suburban line out to Lidcombe, and (*b*) on the southern line to Hurstville, 9 miles, to which there are four tracks. In fact, 62 of the 122 trains are in these areas and another 15 are on the North Shore line between the Harbour Bridge and Hornsby. This line can be reached either via the underground loop and Wynyard low-level platforms, or by a double-track independent electric express line from Strathfield on the main suburban line west of the city, to Wynyard, High Level. Some peak-hour trains originate at North Sydney, beyond the bridge, and using the latter route, run to various western and south-western suburban lines.

Routeing of Services

The routeing of trains over the various sections, mainly by circular or loop routes, is unusually interesting. For instance, all trains from the East Hills south-western branch, and also from either Mortdale or Cronulla to the south, run into Central Station, and then continue counter-clockwise round the underground loop and back again via Central either (*a*) to Homebush near Strathfield on the western line; (*b*) to Hornsby via Strathfield and West



Map of Sydney electrified suburban area, showing with arrowheads the positions of the 122 trains at 5 p.m. during the Monday—Friday rush-hour period

Electric train with automatic doors on northern approach to Harbour Bridge

Ryde on the Northern Line; or (*c*) to Bankstown, 11 miles out on the south-western Regents Park Loop line. These latter trains then proceed via Regents Park to Homebush, there to take up similar or other local routeing. Trains running in the opposite direction between these various terminals run round the underground loop clockwise.

North Shore Trains

Again, North Shore city-bound trains from Hornsby run via Wynyard to Central and thence via Granville, on the western line, to Liverpool, 22 miles out on the main line to Albury, or alternatively to Blacktown, 21 miles, or Penrith, 34 miles distant, both on the western main line. There are corresponding return workings over these same routes, and in the case of the Penrith-Hornsby service a nearly-50-mile continuous run is entailed.

In these and many similar workings there is some express running, stops at certain inner-suburban stations being omitted. There are also numerous shuttle services, such as between Lidcombe and Liverpool via Regents Park, and between Granville and Parramatta, connecting with other services and generally run with two- or four-coach trains.

To relieve the passenger services, fast electric parcel trains run over all suburban lines; they consist of electric parcel vans with or without trailers. Five motor vans and two trailers cover about 285,000 miles a year.

The suburban passenger rolling stock fleet consists of some 560 motor coaches and 580 trailers. They are 10 ft. 6 in. wide and each seats about 80 passengers.

Track and Signalling

In Sydney Central Station, 23 platforms are available for these electric services. On the main (western) line there are six tracks as far as Homebush, 8 miles, and just beyond Strathfield. At Strathfield the northern line diverges towards West Ryde and Hornsby, and there are eight platforms at this junction. A fly-over carries the northern line northbound track over the western lines; there are also two other flying junctions between Central and Redfern.

In the suburban area 341 track-miles are laid with 107-lb. rails and a first-class standard of ballast. The whole 128 route-miles are equipped with automatic signalling—both upper-quadrant and colour-light—train stops, and other safety equipment. Growth of the suburban electrification since 1926 is briefly described on page 648.

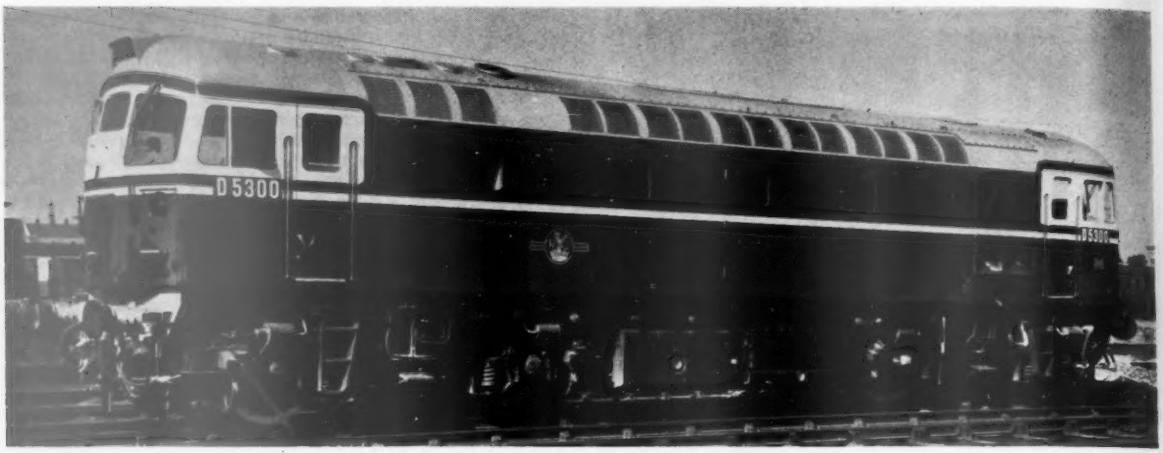
Circular Quay Station on loop, showing overhead roadway

Approach tracks to Sydney Central Station

B.I.C.C. NOTTINGHAM BRANCH OFFICE.—The telephone number of the Nottingham Branch office of British Insulated Callender's Cables Limited has been altered to: Nottingham 55932 (2 lines).

British Railways Diesel-Electric Mixed-Traffic Locomotives

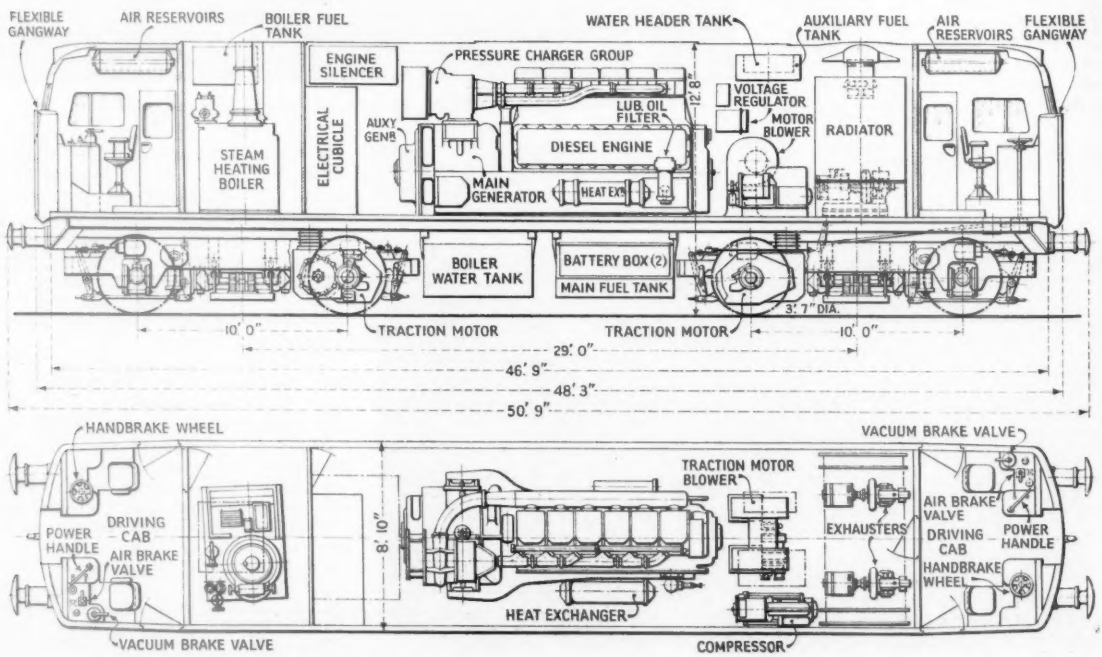
Type "2" 1,600-h.p. Birmingham-Sulzer units now entering service in the Eastern Region



Type "2" 1,160-h.p. Birmingham-built diesel-electric locomotive D5300, one of the first of 20 are to work on the Great Northern Line of British Railways, Eastern Region

As reported in our issue of September 12 the first deliveries of the mixed-traffic Type "2" diesel-electric locomotives built by the Birmingham Railway Carriage & Wagon Co. Ltd. are now entering service in the Eastern Region of British Railways. The power equipment is the British-built 1,160-h.p. Sulzer engine, coupled to a Crompton Parkinson generator. The control equipment is arranged for multiple working with similar units and with other diesel-electric locomotives recently introduced on British Railways. There are duplicate driving cabs at each end. The locomotives are generally similar in outline to the Derby-built British Thomson-Houston/Sulzer units fitted with the same power unit.

At 11 m.p.h. the continuous tractive effort is 30,000 lb. The equipment includes a Stone-Vapor train heating boiler, engine silencer, and electrically heated windscreens. The locomotives Nos. D.5300-D.5337 have been designed and are being constructed to the general requirements of the British Transport Commission under the overall direction of Mr. R. C. Bond and Mr. S. B. Warder, respectively Chief Mechanical Engineer and Chief Electrical Engineer, British Railways Central Staff, B.T.C. As the Eastern Region is the sponsor region for these locomotives, Mr. K. J. Cook, Chief Mechanical & Electrical Engineer of the Region, is respon-



General arrangement and layout of Birmingham-built Type "2" diesel-electric locomotive

Cab control layout showing desk equipment for driver and co-driver

sible for collaboration and inspection during the execution of the contract.

Leading particulars and dimensions are as follows:—

Wheel arrangement		Bo-Bo
Maximum permitted speed		75 m.p.h.
Maximum tractive effort		42,000 lb.
Continuous rating tractive effort		30,000 lb. at approx. 11 m.p.h.
Weight in working order (with full complement of fuel and water)		77½ tons
Fuel capacity—engine		500 gal.
Fuel capacity—boiler		100 gal.
Water capacity for boiler		600 gal.
	ft.	in.
Length over buffers	50	9
Overall width	8	10
Overall height	12	8
Bogie wheelbase	10	0
Bogie pivot centres	29	0
Wheel dia.	3	7

Cab and Superstructure

The framework for the bodyside is a welded assembly of I section diagonal and vertical members arranged to form a deep girder. In each bodyside there are four fixed windows and an access door for maintenance. The power equipment compartment roof, made as a completely detachable unit is fitted with several covers to facilitate removal of individual items of equipment. The roof unit also incorporates a series of filters through which all air is taken for generator and traction motor cooling and induction air for the engine. Monsoon type louvres are fitted to protect the air filters. The cab roof is a double skin of moulded fibreglass.

In the walkways between the two cabs, a second floor of aluminium chequer plate is fitted above the main deck, and in the space betwen the two decks is carried all electrical wiring on one side and all pipework on the other.

The cab is well laid out for crew comfort and good visibility. Fully adjustable upholstered seats are provided for the driver and co-driver, with a cab entrance door behind each seat. On the driver's flat-top desk is the power handle, air brake and vacuum brake valves, locomotive brake release, engine start button and master switch. On a sloping panel are the brake gauges, ammeter, speedometer, and fault indication lamps. The handbrake wheel, boiler pressure gauge, and lighting switches are on the co-driver's desk. Air-operated windscreen wipers and sun visors are provided. To prevent icing and misting the screens are electrically heated from a gold film element incorporated in the safety glass laminations.

Arrangement of Equipment

In the power compartment layout close attention has been given to maintaining the wide walkways possible with the narrow in-line power unit. The exhausters are positioned in the radiator tunnel, and the twin traction motor blower unit between the engine and radiator. Above the blower are the engine instrument panel, voltage regulator, and the roof mounted cooling water header tank and service fuel tank. Also adjacent to the blower are the air compressor and a motor-driven combined pumping set. This incorporates the engine coolant pump, and pumps for lubricating oil priming and fuel transfer.

Above the switchgear cubicle is a large capacity engine exhaust silencer. This is a rectangular steel box, lagged with fibreglass for sound absorption and heat insulation. The gas is discharged into the main casing and passes to atmosphere through a pipe which is coiled in the base of the casing.

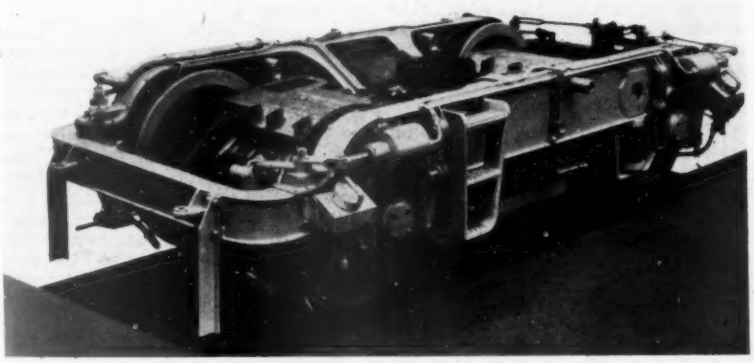
The Stone/Vapor train heating boiler, which is fully automatic in operation, is housed in a compartment between the cab and the electrical cubicle. In this compartment roof is the boiler fuel tank. When the boiler is not operating this fuel is available as an additional engine fuel supply. For maximum sound insulation the cab and boiler compartment bulkheads are of double wall construction sprayed on the inside with limpet asbestos. The boiler water tank, engine fuel tank, and pull-out containers for the Nife batteries are underslung between the bogies.

Engine

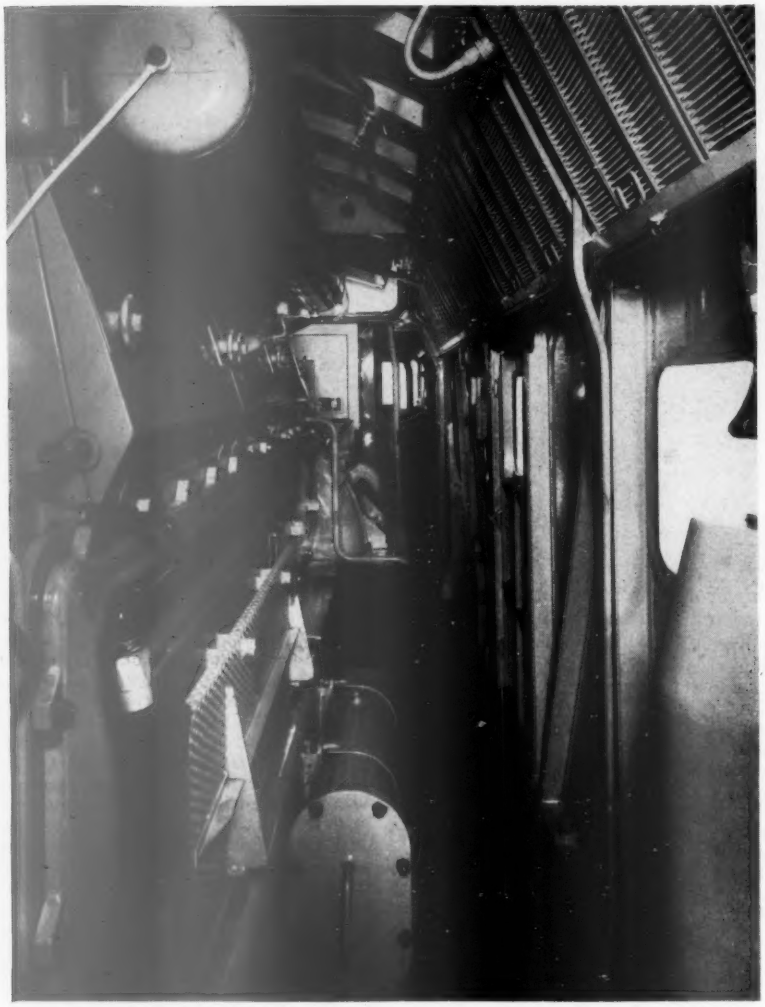
Power is supplied by a six-cylinder Sulzer diesel engine type 6LDA28, direct coupled to a Crompton Parkinson generator. The pressure charged engine, built at Vickers Armstrong, Barrow, is 280 mm. bore × 360 mm. stroke and is rated at 1,160 b.h.p. at 750 r.p.m The main carcase is a welded fabrication, with an extension of the crankcase to form a mounting for the generator. The steel sump and main oil pipes are welded in position. At the free end of the crankshaft, which is carried in pre-finished tri-metal bearings, is fitted a Holset vibration damper. Individual fuel pumps of C.A.V. manufacture are operated from the valve gear camshaft. The pump plungers incorporate an additional helix whereby the injection timing point is advanced as the load increases. Both full-flow and by-pass lub: oil filters are fitted.

Cooling

The cooling unit comprises two radiator panels in the bodyside cowled on the inside to form an enclosure with the roof-mounted axial flow fan. To



Welded box form bogie with externally mounted brake cylinders



View of the power compartment gangway, showing the continuous bank of air inlet filters and the hinged engine servicing platforms

prevent freezing, tanks are fitted in the base of the panels to allow these to drain when the engine is shut down. Circulation through the engine is thermostatically controlled and the electrically driven fan is arranged for two-speed operation; also thermostatically controlled. The water circulating pump is driven by an electric motor. Control of the lub: oil temperature is by a heat exchanger coupled to the engine cooling water circuit.

Electrical Equipment

The 10-pole single bearing Crompton Parkinson main generator is rated at 757 kW., 1 720 amp. at 750 r.p.m. The Crompton rotating type brushgear, which permits the brushgear to be turned to the most convenient servicing position, is incorporated. For engine starting the generator is motored from the battery. On the main armature shaft is also mounted the auxiliary generator armature. This 8-pole generator, which for compactness is recessed into the main generator, is rated at 57 kW., with a constant voltage of 110 volts at all engine speeds. The nose suspended series wound traction motors have a continuous rating of 224 h.p., 430 amp., 440 volts. A resilient type gear is incorporated in the reduction gear. The traction motor blower unit comprises a 14·2-h.p. 2-speed Crompton motor driving two blowers.

The Allen West combined H.T. and auxiliary switchgear cubicle is mounted at the generator end of the power unit. The traction motors are connected in permanent parallel and the motor contractors are of the electro-pneumatic type. Under control of the load regulator automatic field weakening is introduced in five stages by means of a pilot motor operated drum. The cubicle equipment is divided into two groups, covering the main power and the auxiliary equipment. The voltmeters and ammeters are housed in the side of the cubicle, together with the engine and electrical fault indicating lamps.

The bogies are of the equalising beam type with swing bolsters sprung on elliptical springs. Helical springs are used to support the bogie frame. The general construction of the main members is mild steel plate fabricated as box sections. Spring flanks are in cast steel. The bearing seats for the cast steel centre pivots are 20 in. dia. These are fitted with hard bronze liners for load carrying and manganese steel liners for traction and braking forces. Skefko roller bearing axleboxes and rolled steel wheels and tyres are fitted. Double channel members with welded fabricated stretchers form the main frame. The plate headstocks and dragboxes, carrying standard B.R. screw couplers and buffers, are also of fabricated construction.

Brakes

The brake equipment, supplied by Davies & Metcalfe, provides air braking on the locomotive and vacuum braking for the train. One 8-in. dia. brake cylinder is mounted above each axlebox, and for operation with unfitted stock is controlled by an Oerlikon type self-lapping diaphragm valve. For operation with vacuum braked stock the air brakes are controlled from the driver's vacuum brake valve through a triple valve, to give the required amount of locomotive braking or release. To facilitate uncoupling, the locomotive brakes may be released independently of the vacuum brakes on the train. An anti-slip device is incorporated in the air brake control to reduce the use of sanding under poor adhesion conditions.

Two Reavell exhausters type F.R.U. 5¼ in. × 8 in., fitted with two-speed Crompton motors, are provided for vacuum brake operation. The air brakes are supplied by a Davies & Metcalfe three-cylinder Oerlikon type compressor.

Sub-contractors for the locomotives include:—

Generators	Crompton Parkinson Limited
Switchgear	Allen West & Co. Ltd.
Diesel engine	Sulzer Bros. (London) Ltd.
Brake equipment ..	Davies & Metcalfe Limited
Air filters	Vokes Limited
Roller bearing axleboxes	Skefko Ball Bearing Co. Ltd.
Radiators	Serck Radiators Limited
Train heating boiler ..	J. Stone & Co. (Deptford) Ltd.
Fire extinguisher equipment	Pyrene Co. Ltd.
Batteries	Nife Batteries Limited
Windscreen wipers ..	Trico-Folberth Limited
Speedometer and mileage recorder	Smiths Industrial Instruments Limited
Windows	Beckett, Laycock & Watkinson Limited
Wheels and axles ..	Owen & Dyson Limited

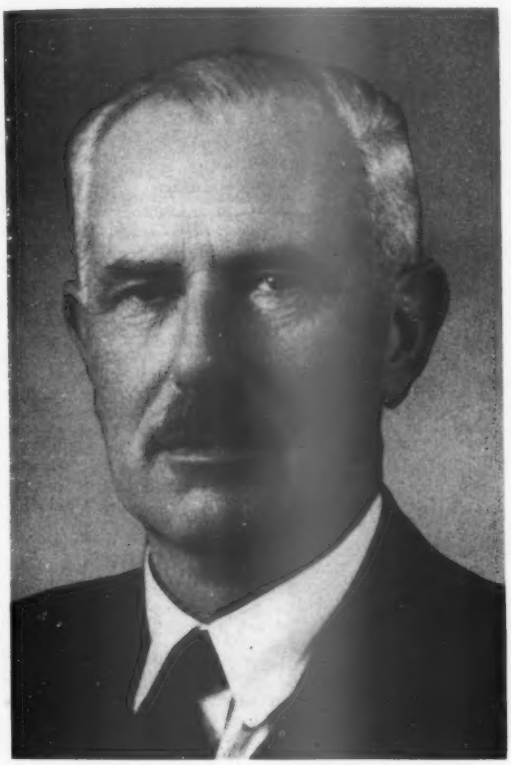
CLOSURE OF WRAGBY TO DONINGTON-ON-BAIN SECTION.—British Railways, Eastern Region, has announced that from December 1, the section of the branch line, Donington-on-Bain (inclusive) to Wragby (exclusive) will be closed to all traffic. The stations concerned are Donington-on-Bain, South Willingham, and East Barkwith. C. & D. services for parcels and merchandise will continue to be maintained by road vehicles from Lincoln or Louth. Alternative facilities for traffic carted by traders will be available at Louth and Wragby. The passenger service was withdrawn some years ago from the Louth to Bardney line, including the section now to be closed entirely.

RAILWAY NEWS SECTION

PERSONAL

Mr. M. J. Patel, Deputy Chief Engineer, Western Railway of India, has been appointed Deputy General Manager of that system.

Mr. F. E. Campion, M.I.C.E., Chief Civil Engineer, Southern Region, British Railways, who, as recorded in our October 31 issue, is retiring, was educated at Seafield School, Bexhill, and Uppingham. He began his career in 1912 with the Great Northern Railway (Ireland) as a pupil under his father, the late Mr. F. A. Campion, M.I.C.E., who was Chief Engineer, and later under Mr. C. J. Brown, then Chief Engineer, G.N.R., England. During 1914-15 he held a commission in the Royal Engineers (Special Reserve), Mr. Campion was appointed as an Assistant on the G.N.R. (I.) in 1916, and four years later joined the L.B.S.C.R. as Resident Engineer on the Oxted tunnel repairs. In 1921 he was transferred to East Croydon as Assistant District Engineer. After the amalgamation he became Assistant Divisional Engineer, London East, Southern Railway, in 1923, and was transferred to Head Office four years later. From 1930 to 1933 Mr. Campion was Assistant for Special Works, and from 1933 to 1935 was Assistant to the Chief Engineer. In 1935 he was appointed Divisional Engineer, London East, and, in 1940, Divisional Engineer, London West. He became Maintenance Engineer in 1946 and, on nationalisation, he was appointed Assistant Civil Engineer, Southern Region. In the last few years he has been responsible for a number of modernisation major works, including widenings between Bickley Junction and Swanley; and between Rainham and Newington, together with a considerable number of carriage and repair sheds, substations and structures required in connection with the Southern Region's Kent coast electrification schemes under the modernisation plan.



Mr. F. E. Campion
Chief Civil Engineer, Southern Region, who has retired

Mr. A. H. Cantrell
Appointed Chief Civil Engineer, Southern Region

County Councillor J. S. Goodwin has been appointed a Member of the Transport Users' Consultative Committee, North Eastern Area until May 31, 1960, as one of the representatives of local authorities, in place of County Councillor T. Willis, J.P., who has resigned. Mr. Goodwin is Vice-Chairman of the Durham County Council, of which he has been a member since 1947. He has also been a member of Seaham Urban District Council since 1930.

Mr. T. J. Boyle has been appointed Assistant Engineer, Bridges, Canadian Pacific Railway. Mr. Boyle joined the C.P.R. in 1946 as an assistant engineer, in Montreal, and in 1955 was appointed Special Engineer in connection with the construction of the St. Lawrence Seaway Canal, to be opened next year.

Mr. A. H. Cantrell, E.R.D. B.Sc.(Eng.), M.Inst.C.E., Assistant Civil Engineer, Southern Region, British Railways, who, as recorded in our October 31 issue, has been appointed Chief Civil Engineer, was on the staff of the Bridge Stress Committee of the Department of the Scientific & Industrial Research from 1924 to 1927. He afterwards joined the staff of the Chief Engineer, Southern Railway, as a Draughtsman in the Bridge Office. Mr. Cantrell was appointed Resident Engineer on various Bridge reconstruction works until 1931, when he returned to the Bridge Office. In 1935 he was transferred to the Office of the London East Divisional Engineer in charge of the Permanent Way Section. He was appointed Engineering Assistant in the same Office in 1939, and carried out investigations into rail welding and the blanketing of track. Mr. Cantrell was commissioned in the Supplementary Reserve, R.E., in 1939, and went to France at the outbreak of war. After various appointments in Movement Control, he was transferred to Railway Construction in 1941 and saw service in North Africa, Sicily and Italy. On demobilisation, in 1945, he held the rank of Lt.-Colonel and was in command of a Railway Construction Group, R.E. He was mentioned in despatches three times and was awarded the American decoration of the Legion of Merit. Mr. Cantrell was appointed Assistant Divisional

Engineer, London East, in May 1942; Divisional Engineer, London West, in August, 1946; and Divisional Engineer, London East, in November 1947. He was appointed Assistant Civil Engineer, Southern Region, in June 1951, which post he is now vacating to take up his new appointment.

Mr. G. R. Chrimes, Acting Assistant to the Motive Power Officer, Waterloo, Southern Region, British Railways, has been appointed Train Running Assistant to the Motive Power Officer, Waterloo, Southern Region.

Mr. J. M. Bentham, Assistant Engineer, Bridges, Canadian Pacific Railway, has been appointed Engineer, Track. Mr. Bentham joined the C.P.R. as a bridge inspector in 1947, was promoted to be an assistant engineer in 1948. He became Assistant Engineer, Bridges, in 1955.

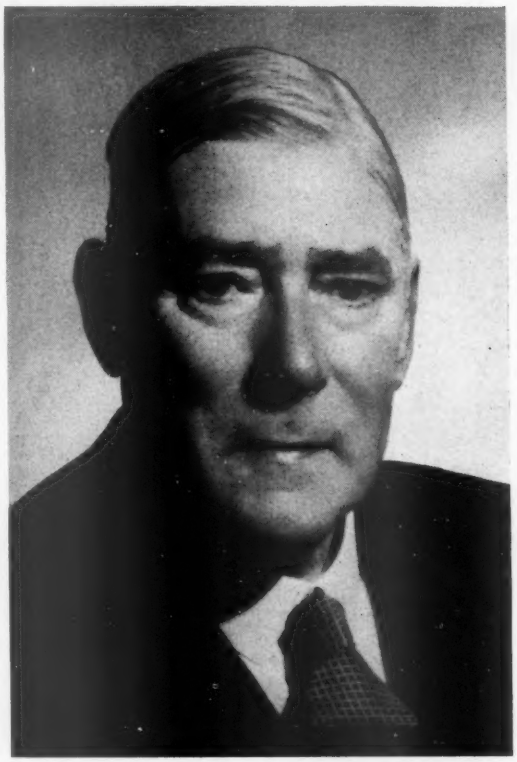
Lord Aberconway is relinquishing the Chairmanship of Firth Brown Tools Limited, a subsidiary of John Brown & Co. Ltd., and will be succeeded by Mr. E. Mensforth. Lord Aberconway will become Deputy Chairman of the company. Mr. Mensforth is relinquishing the office of Managing Director and will be succeeded by Mr. T. H. Burleigh, Sales Director. Mr. G. W. Hand has resigned from the board, on taking up an appointment with an associated company. Mr. C. A. Grayson, Mr. W. Burnan, and Mr. H. Burden, executives of Firth Brown Tools Limited, have been appointed Directors. Mr. R. J. Barclay has been appointed to the board.

Mr. John Smith has been appointed Technical Director of Petters Limited. He was previously Technical Director of the National Gas & Oil Engine Co. Ltd.

Mr. J. F. L. Gracias, an assistant accountant, East African Railways & Harbours, has retired. He joined the Uganda Railway in 1909 as Temporary Junior Clerk. For most of his service Mr. Gracias has been in charge of the Capital Works & Expenditure Section, and, on a number of occasions, has been seconded for special duties, both in Kenya and Uganda. He was one of the two first Asian Senior Officers to be appointed, and was made an Honorary Member of the Order of the British Empire in 1936. Mr. Gracias has served under five Chief Accountants and ten General Managers. Mr. Gracias is the sole surviving Founder Member of the Railway Goan Institute in Nairobi, of which he is now a Life Member. He is also a Life Member of the Goan Overseas Association, of which he has been Senior Vice President for three years.

Mr. Eamonn Ceannt has been appointed Administrative Assistant, on Organisation, Coras Iompair Eireann. He will be seconded from the Department of Finance, where he has been Assistant Principal Officer since 1950.

Mr. Frederick Seymour Whalley, M.C., F.C.G.I., M.I.Mech.E., former Chairman of Vulcan Foundry Limited and of Robert Stephenson & Hawthorns Limited, whose death, at the age of 73, was recorded in our last week's issue, was educated at the King's School, Canterbury, and the City & Guilds Central Technical College, London. After practical training in the locomotive works of the Vulcan Foundry Limited, and subsequently in the Running Department of the London & South Western Railway, Eastleigh, he was appointed, in 1910, Assistant Locomotive Superintendent, North Western Railway of India. In 1914, he was acting as Secretary to the Locomotive & Carriage Superintendents' Committee, Indian Railway Conference Association, but at the outbreak of war he accompanied Indian Expeditionary Force "B" overseas with a commission in the Royal Engineers, serving with the Railway Corps in East Africa. He was mentioned twice in despatches, awarded the Military Cross, and promoted to the rank of Major; and ultimately held the position of Chief Mechanical Engineer, East African Military Railways. He returned to India, in 1921, as District Locomotive Superintendent, N.W.R. In 1923, Mr. Whalley became General Manager, Vulcan Foundry Limited, was appointed Managing Director in 1929, Vice-Chairman in 1941, and Chairman in 1946. He was President of the Manchester & District Engineering Employers' Association in 1931, 1932 and 1933, and President of the Locomotive Manufacturers' Association from 1936 to 1947. In 1940, he was appointed Chairman of the Locomotive Manufacturers' Export Group, and, in 1942, Chairman of the newly-formed Railway Engineering Supply Industries Joint Committee. From 1941 to 1945, he was a Director of the North British Locomotive Co. Ltd., and, in 1944, he was elected Chairman of Robert Stephenson & Hawthorns Limited. Mr. Whalley was President of the Institution of Locomotive Engineers for 1946-47. He relinquished the chairmanship of the Vulcan Foundry Limited and of Robert Stephenson & Hawthorns Limited in 1951, although continuing to serve on the boards of both companies until December, 1954.



The late Mr. F. S. Whalley

Formerly Chairman of Vulcan Foundry and Robert Stephenson & Hawthorns Limited

A memorial service was held at All Saints Church, Marlow, on November 19. Among those who attended, in addition to family mourners, were:—Brigadier S. Collingwood; Colonel Collingwood; Lieut-Colonel W. A. C. Collingwood; Messrs. B. S. Townroe and S. C. Townroe; Colonel G. Walton (also representing Sir Cusack and Lady Walton); Sir Henry Holland; Mr. R. Arbuthnott, President of Institute of Locomotive Engineers; Mr. G. R. Curry (representing the Locomotive & Allied Manufacturers' Association); Mr. G. T. Hart (representing the Institution of Locomotive Engineers); Messrs. R. T. Bolter, D. E. Gudgin, H. Smedley, W. Fairhurst, J. Wilson, C. Rhodes and Miss Carter, all from the Vulcan Foundry Limited; Mr. D. Wood; Mr. G. Stephenson (representing the Institute of City & Guilds); Colonel M. O. Clarke.

Mr. George Dow, Commercial Officer, London Midland Region, British Railways, has been appointed Divisional Traffic Manager, West Midlands Division. He will make his headquarters in Birmingham shortly.

Mr. A. Readman, A.M.I.E.E., has been appointed Principal Executive Assistant, London Transport Executive, with the title of Testing Superintendent, Chief Electrical Engineer's Department. Mr. Readman joined the electrical staff of the Metropolitan Railway in 1932 and was transferred to the Underground section in 1934. In his new appointment he will be responsible for testing, maintenance and development of metering and protection equipment for generating stations.

Mr. J. P. Ford has resigned from the Board of Associated British Engineering, Limited.

Mr. George Taylor has been appointed Assistant General Manager of Head Wrightson Steel Foundries Limited.

Owing to other commitments in the Vickers Group, Mr. A. H. Hird has relinquished his seat on the board of Vickers-Armstrongs (Engineers) Limited.

Mr. J. Harwood Fryer has resigned from the Board of Crompton Parkinson Limited. He was appointed Managing Director in 1946, a position held until his retirement from executive duties in 1957.

Mr. J. Parker

Appointed Assistant Civil Engineer, Southern Region

The late Mr. M. G. J. McHaffie

Docks Engineer, Southampton, Southern Railway, and Southern Region, 1936-48

Mr. J. F. M. Taylor

Appointed District, Traffic, Superintendent, Swansea, Western Region

Mr. John Parker, B.Sc., M.I.C.E., District Engineer, Brighton, Southern Region, British Railways, who, as recorded in our October 31 issue has been appointed Assistant, Civil Engineer, received technical education at Armstrong College (now King's College), Durham University, and in 1924-25 was engaged in trunk road survey work under the Ministry of Transport. In 1926-27 he was on the staff of the Bridge Stress Committee of the Department of Scientific & Industrial Research, and from 1928 to 1935 was Assistant Engineer, Central Argentine Railway. In 1935 Mr. Parker joined the Southern Railway and, after serving in the Bridge Office and the Office of the Maintenance Engineer, was appointed Chief Technical Assistant, Southern Divisional Engineer's Office, Brighton, in 1939. He became Assistant Divisional Engineer, London West Division, Woking, in 1945; Assistant Divisional Engineer, Southern Division, Brighton, in 1947, and Divisional Engineer, Brighton, in February, 1948.

Mr. Donald C. Altman has been appointed Assistant Managing Director of Allis-Chalmers, Great Britain, Limited.

Mr. A. J. Turner, Assistant General Manager, Thos. Cook & Son Ltd., has been co-opted a member of the council of the Chartered Institute of Secretaries.

Mr. John Taylor, Works Manager, Leigh Works, British Insulated Callender's Cables Limited, has retired after almost 50 years' service with the company.

Mr. Francis Cox, Chief Production Engineer, the Tees Side Bridge & Engineering Works Limited, has been appointed Production Director, and Mr. Stanley D. Hodgson, Assistant Manager, becomes Technical Director.

Mr. B. E. Richmond has relinquished his position as General Factory Manager, Tecalemit Limited, to concentrate his activities as Managing Director of Foamite Limited. Mr. J. E. Drinkwater becomes General Factory Manager, and Mr. H. E. Jackson, Chief Engineer.

We regret to record the death on November 16, at the age of 76, of Mr. M. G. J. McHaffie, M.I.C.E., M.Inst.T., Docks Engineer, Southampton, Southern Railway and Southern Region, British Railways, 1936-48. Mr. McHaffie was associated with the development of Southampton Docks since the London & South Western Railway acquired the undertaking. After his early work in the Docks Engineer's Department, Mr. McHaffie was, in 1907, temporarily transferred to the Chief Engineer's Department Eastleigh. On returning to Southampton, he was associated with further developments, including the Ocean Dock. After service with the Royal Engineers during the 1914-18 war, he returned to the L.S.W.R., and subsequently was Resident Engineer in charge of the design and construction of the new docks at Southampton. Mr. McHaffie became Docks Engineer, Southern Railway, in 1936, the position from which he retired in 1948.

Institution of Locomotive Engineers

The following names have been entered on or transferred in the register of members of the Institution of Locomotive Engineers.

Associate Members

Mr. R. W. Purdom, Resident Engineer (Traction Department), English Electric Co. Ltd., Argentina.

Mr. L. W. Taylor, Divisional Motive Power, L.M. Region (Midland Division), British Railways, Derby.

Associates

Mr. G. T. Bevan, Application Engineer, Locomotive & Car Equipment Department, General Electric Company, U.S.A.

Mr. V. H. F. Hopkins, Manager of Engineering, English Electric Co. Ltd., Diesel Engine Division, Rugby.

Mr. L. A. Potter, Head Office Sales Supervisor, Shell Mex & B.P. Limited.

Transfer Associate Member to Member

Mr. R. A. A. Bryant, Senior Lecturer in Mechanical Engineering, The N.S.W. University of Technology, New South Wales, Australia.

Transfer Graduate to Associate Member

Mr. M. M. Luther, Planning Officer (Mechanical), Office of Chief Mechanical Engineer, Central Railway, India.

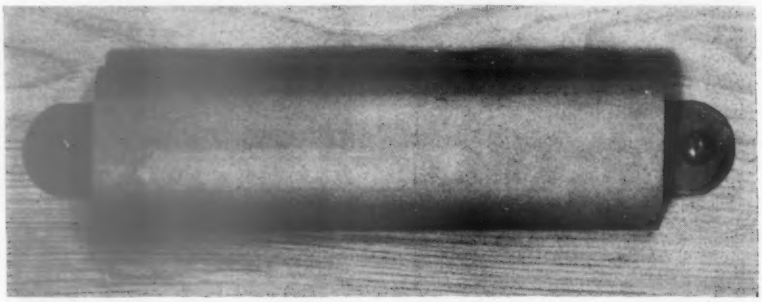
Mr. J. F. M. Taylor, Divisional Superintendent, Swansea, Western Region, British Railways, who, as recorded in our October 24 issue, has been appointed District, Traffic, Superintendent, Swansea, joined the Great Western Railway in 1924 in the General Manager's Office. In 1935, Mr. Taylor was loaned to the Chinese Government as Secretary to a commission reporting on the Chinese Railways. Later that year he was transferred to the Office of the Superintendent of the Line, G.W.R., as a train runner. In 1937 he was Secretary to the Hammond Commission, appointed by the Government to report on transport in Ceylon. In 1938, he was appointed Junior Assistant to the District Traffic Manager, Plymouth. In 1939, he was loaned to the Railway Executive Committee, and later he was appointed an assistant secretary He was appointed Chief Clerk in the Divisional Superintendent's Office, Worcester, in February, 1941, and Divisional Superintendent there, eight months later. Mr. Taylor became Divisional Superintendent at Worcester in 1942, and at Cardiff in 1947. He is a member of the Swansea Chamber of Commerce.

Mr. E. D. Dawson has been appointed a director of the Selson Machine Tool Co. Ltd., a member of the George Cohen 600 Group. Mr. Dawson joined the company in 1936 and has been Sales Manager since 1954. He retains responsibility for sales.

Mr. Eric Walker has been appointed Managing Director of the Phosphor Bronze Co. Ltd., a member of the Birfield Group, in succession to Mr. A. N. Wormleighton. Mr. Walker will be assisted by Mr. Philip Broadbent as Works Manager, Mr. Jack Kitchen as Sales Manager and Mr. Gordon Swinyard as Chief Metallurgist.

Mr. A. W. A. Dick-Cleland, who recently relinquished his appointment as Joint Managing Director, Lancashire Dynamo & Crypton Limited, has been appointed a director of Brush Electrical Engineering Co. Ltd. and Manager of their Rotating Machines Division, Loughborough.

NEW EQUIPMENT AND PROCESSES



Double-Ended Boring Machine

SAVING of time in machining is claimed for a double-ended boring machine in which relief bores are produced simultaneously at both ends of a gear cluster. The automatic operation sequence is: (1) boring heads advance to full depth at rapid approach speed, to depth stop; (2) boring tools feed out to produce relief diameter; (3) boring heads retract at required feed rate, to machine relief; (4) limit switches initiate rapid withdrawal of boring tools; and (5) boring heads return at fast rate, to loading position.

Each spindle is driven by its own 3-h.p. motor and the heads derive their facing traverse from hydraulic cylinders which give infinitely variable rates of out- and in-feed. A positive depth stop in the facing slide ensures accurate repetition of bore diameters.

Each complete unit is mounted independently on a hydraulically-operated slide with front dead stop positioning, but a simply adjusted limit switch control bar permits the setting of other traverse lengths (rapid or feeding) within the range of the slide stroke. The control fixture is electro-mechanically operated. Electrical wiring is carried in overhead trunking to keep it clear of coolant and swarf. The self-contained hydraulic tank can easily be separated from the machine, if required.

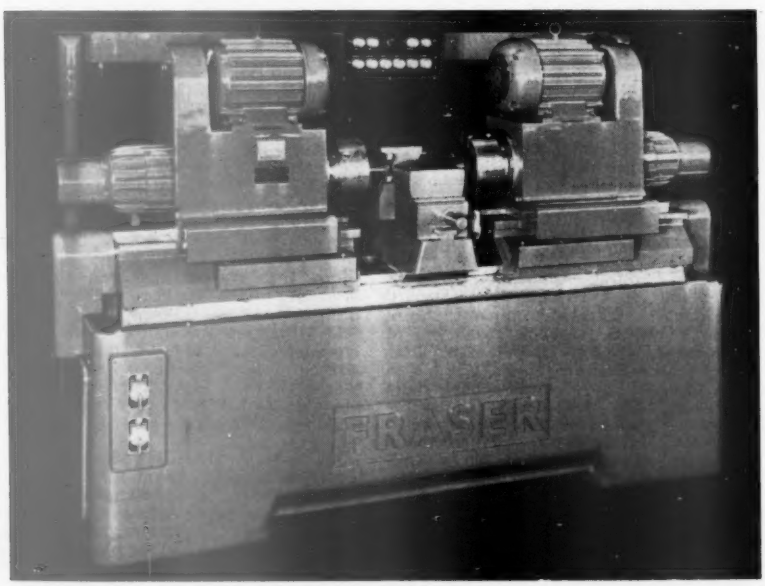
Further details may be obtained from the manufacturer, Douglas Fraser & Sons Ltd., of Arbroath, Scotland.

Industrial Magnifier

VISUAL inspection and assembly of small parts in all railway mechanical engineering work should be facilitated by the Widefield industrial magnifier.

It is self-contained with illumination from mains supply. The oil filled plastic lens of wide aperture—6¾ in. × 4½ in.—is claimed to give a large field of inspection for small components. Magnification is 1·8. Lighting by pigmy lamps in B.C. holders, is positioned to give even illumination over the whole working area and to avoid any reflected glare.

The heavy base, designed to mount the magnifier rigidly whatever the position of the lens, is drilled for screwing to a bench, if required. The lens, mounted on friction bearings for ease of manipulation, can be locked in any position by one hand. The price complete with lamps is £6 15s. net. Further details, including delivery, may be obtained from the manufacturer, Fleming Safety Equipment (Division of J. & R. Fleming, Limited), 146 Clerkenwell Road, London, E.C.1.



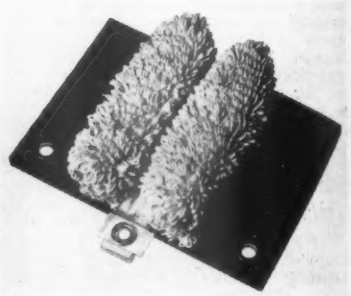
Protector Fenders

DAMAGE to walls and partitions in goods depots and transit sheds and on vehicles is prevented by the Goodyear Protector Fender, which consists of an extruded D section of white, abrasion-resistant rubber, held in place by a substantial nickel-plated strap.

These fenders can be easily fitted in garages at bumper level and on any projections where a lorry door is liable to swing. If fitted to loading bays, the fenders are claimed to protect the buildings, the vehicles using the bays and often the goods being loaded or unloaded, all without any maintenance.

The rubber used is compounded to withstand all the knocks and chafing likely to be encountered, without being damaged. The manufacturers state that a hollow D section is used because it has the required degree of resilience, and is steady when fitted.

The retail price is 7s. 6d. a pair and delivery can be made in two to three weeks. Distribution is through the usual Goodyear motor accessory factors. Further details may be obtained from the manufacturers, Goodyear Tyre & Rubber Co. (Great Britain) Ltd., Wolverhampton.



Journal Lubricator

A COMBINATION of wool felt, foam neoprene, and chenille used in the Premier journal lubricator for rolling stock is claimed to provide a low operating temperature, with reduced sensitivity to dirt.

The Premier is composed of: wool felt base, twin foam-neoprene centre cores, and cotton duck covering, with disturbable chenille wicking loops. The wool felt base serves as an oil reservoir, prevents damage to the lubricating pad, and eliminates "wick grabs" by the bearing. Twin foam-neoprene centre cores are stated to result in positive journal contact without excess pressures which cause high operating temperatures. The best wicking action is obtained in the centre section between the neoprene cores.

Two strands of tufts (72 wicks) are clear of the journal on each side. As the vehicle starts to move, the oil-saturated tufts from one side are drawn under the journal, immediately depositing a quantity of oil. This feature is important in cold weather.

Further details may be obtained from the manufacturer, the Premier Manufacturing Corporation, 107 Penn Avenue, Pittsburgh 21, Pa., U.S.A.

Ministry of Transport Accident Report

Gloucester Road Junction, March 4, 1958: British Railways, Southern Region

Colonel D. McMullen, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at 12.58 p.m. on March 4, 1958, at Gloucester Road Junction, near Norwood Junction, when the 9.41 a.m. steam parcels train, Brighton to London Bridge, consisting of 12 vans, drawn by an "N" class 2-6-0 engine with right-hand drive, failed to stop at a colour-light signal at red and, converging on a junction, came into sidelong collision at about 10-15 m.p.h. with the 12.55 p.m. electric passenger train, West Croydon to Victoria, which was approaching at about 20 m.p.h., the speed limit at that point, under clear signals. The engine struck and derailed the third coach, which it forced over, and some other wheels were also derailed and damage done. Five passengers and the guard received slight injury or suffered from shock and were taken to hospital but discharged the same day. Current was cut off to the point fouling points of the down and up West Croydon lines. Both levers are locked normal when the junctions ahead are set for a train to or from West Croydon; but there is no interlocking between lever 88 and the junction points.

View of Signals

With right-hand drive, signal 88/89 comes into the driver's view at 120 yd. and goes out of it at 39. Signal 10/11 is first seen at 219 yd. and goes out of view at 53. From the fireman's left-hand side signal 88/89 is seen first at 230 yd. and remains thereafter in view. Signal 10/11 is observed at 313 yd., goes out of view at 189 but is seen once more at 76 yd. The driver therefore sees signal 10/11 22 yd. before he observes 88/89, which itself does not come into view for him until track circuit AX has become occupied. Its delayed clearance therefore is not observed.

The signals were cleared for the electric illuminated. He assumed, therefore, that he was being sent by the usual route but soon realised he was not and was passing signal 10/11 at red. He made a full brake application. His speed was then about 20 m.p.h. but distance to the junction on the falling gradient was too short to stop in. He thought that speed had been reduced to about 10 m.p.h. when the collision occurred. His fireman had not mentioned the direction indicator at signal 88/89. He thought he had "a lunar light" which would take him "round the East Croydon local spur but apparently this was not so." Whether it was "a trick of the light" he did not know. He did not notice the red banner flag placed on that spur and thought the engineer's "block" might have been removed; he was insistent he had not forgotten the re-routeing of the train. He said that he did not rely on the fireman altogether to look for signals but did ask him about some seen more

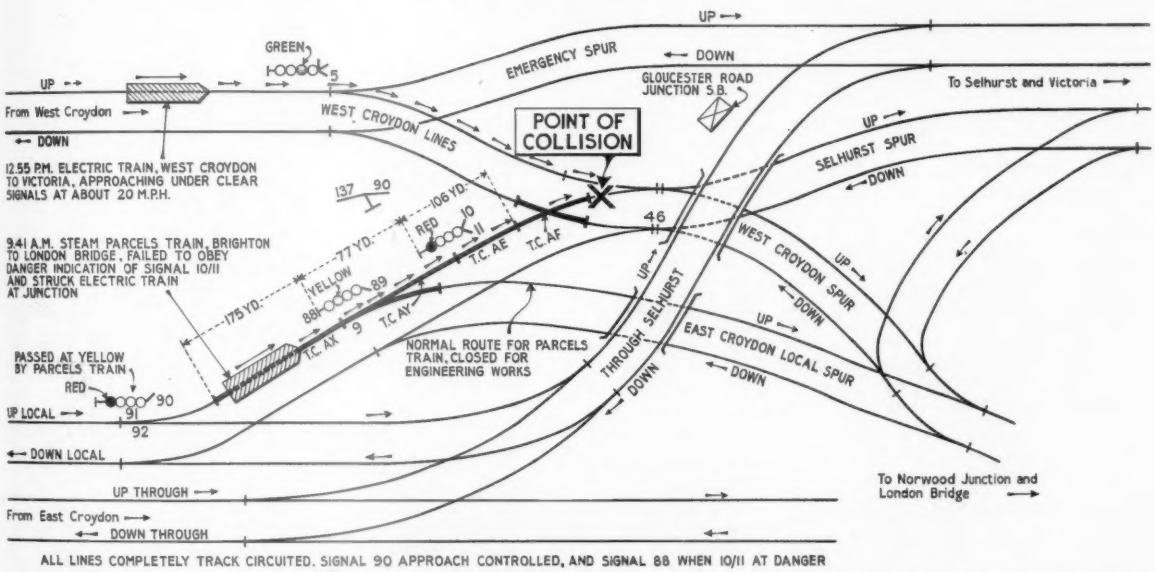


Diagram showing circumstances of accident at Gloucester Road Junction, British Railways, Southern Region, March 4, 1958

of derailment by the accident and not from adjacent lines until rather later. The junction became blocked and diversions had to be made but normal working was resumed at 11.53 p.m. The weather was fine. The accompanying diagram shows the lines, signals, track circuits and so on essential to an understanding of the case.

Signalling

All lines are completely track circuited and equipped with multiple-aspect colour-light signals controlled from a power frame in Gloucester Road Junction box. Signal 90 is approach controlled from red and, if signal 10/11 is red, signal 88 also is similarly controlled from red to yellow by track circuit AX. This latter signal is 175 yd. in advance of the fouling point of points 92. Signal 10/11, 77 yd. further on, protects the converging junction and allows an eight-car electric train to stand at it and be clear of the fouling point of points 92. It is 106 and 125 yd. in rear of the train in the regular way. The normal route for the parcels train is along the East Croydon local spur. The Engineering Department had possession of it for bridge repairs and the altered routeing had been notified to all concerned. The levers of signals 90 and 88 were pulled to allow the train to come up to signal 10/11, which remained all the time at red, and their aspects changed to yellow when the respective approach track circuits became occupied.

The parcels train driver, aged 61 with 43 years' service, 13 as driver, knew the route well and had read the notice about the diversion via the West Croydon spur. He said he left East Croydon at 12.56 and approaching signal 90 slowly, saw it change to yellow, with direction indicator lighted.

His fireman first saw signal 88/89 and reported that it was yellow and shortly after he himself observed signal 10/11 at red and 88/89 at yellow, but thought the direction indicator above the latter was readily from his side. He was actually teaching him the signals and intended to point out the next on the East Croydon spur; he had not mentioned to him that the train was to be diverted.

The fireman first saw signal 88/89 at yellow and expected to see the direction indicator lighted but said definitely that it was not. Nevertheless he did not tell the driver about it.

Conclusion

Responsibility rests with the driver for failing to stop at signal 10/11. He thought he saw the direction indicator at signal 88/89 illuminated but must have been mistaken. Colonel McMullen thinks the only possible explanation to be that the driver became momentarily confused as to which direction he was to take; as soon as he realised he was going straight on he applied the brake fully. He is thought not to have received all the help he might have expected from his fireman who could

have seen signal 88/89 before he did and should have seen it change from red to yellow. The fireman did not know about the re-routeing and expected to see the direction indicator illuminated; when he told the driver the aspect was yellow he should have mentioned that it was not lighted.

Severe curvature with the obscuring effect of smoke and steam on the periscope of his van—the second vehicle—made it difficult for the guard to observe the signals and no responsibility attaches to him. The fact that electric pressure was not removed from adjacent lines until sometime later resulted from a misunderstanding between the two signalmen at Gloucester Road Junction box; steps have been taken to prevent a recurrence.

Remarks

Operating reasons require that a train waiting on the up local line to give preference to one on the West Croydon line shall be clear of points 92. For this reason signal 10/11 was provided only 106 yd. from the fouling point of the down West Croydon line when colour-light signalling was brought into use in 1954. Signal 88/89 was installed later because drivers found the close proximity of 10/11 to points 9 was confusing. They had to obey it when travelling towards the converging junction but disregard it when routed to the East Croydon local spur.

Since September, 1954, signal 10/11 has been overrun nine times including the present case and two occasions since. On five the overrun was only 15 to 30 yd., but on four varied from 150 to 475 yd. when an accident would have resulted had there been a train to or from West Croydon at the time. Both electric and steam trains have been involved and several overruns undoubtedly have been caused by drivers becoming confused by the closeness of signals 88/89 and 10/11.

Colonel McMullen discussed the matter with the railway officers and is glad to report that:—(*a*) the approach track circuit on 88/89 is being split so that with 10/11 at danger 88 will not clear to yellow until the train is about 50 yd. from it; and (*b*) the interlocking is being altered so that pulling lever 88 will lock points 46 for the down local line and points 5 for the emergency spur, with a time release to prevent lever 88 being replaced too soon after a train passes the signal.

This will ensure that a driver will have a reasonably long view of 88/89 at red, even from the right-hand side of a steam engine, and should invariably see the aspect change from red and be in no doubt as to which route he is to take. An overrun of 10/11 will then be less likely to occur. If one should, however, a collision cannot take place as the movement will be isolated by the setting of the points.

These alterations will to a large extent preserve the operating facilities by enabling trains to be drawn up to signal 10/11 and should entirely eliminate the possibility of a recurrence of an accident of this type.

PONDICHERI RAILWAY COMPANY RESULTS.—The net income of the Pondicheri Railway Co. Ltd. for the year ended March 31, 1957, was £593, against £472 for the preceding year. Of this, £200 is allocated to reserve (against £200 to sinking fund, last year). There is no allocation to dividend (£280 last year). The amount carried forward is £5,248 (£4,855). Current assets are £7,479 (£7,924) and liabilities £1,198 (£2,134). The railway is now worked by the Southern Railway of India.

Ferodo Limited Research Laboratory Opened

Development of railway and other brake blocks, and research into, and testing of, friction materials

The Duke of Edinburgh opened the Ferodo research laboratories at Chapel-en-le-Frith, Derbyshire, on November 21.

The work of the laboratories is divided into four principal phases; fundamental research into friction and raw materials, development and improvement of new and existing types of railway and other brake blocks and linings, testing friction materials on specially designed machines and vehicles on the road, and designing methods of manufacturing materials in the factory.

Test House

The test house is equipped with inertia test dynamometers. The larger are engaged on railway, heavy transport, and industrial brakes; the smaller on development for motor-cars and motor cycles. A typical control panel can operate a machine automatically at a number of speeds, time cycles, braking torques, cooling settings, and times, all pre-selected over a sequence of 2,500 brakings.

Testing Railway Brake Blocks

The machines consist of a driving motor coupled to a shaft carrying a bank of flywheels. In testing brake blocks for railway rolling stock, a railway wheel is mounted on one end of the shaft while the shoe assembly is attached to a torque reaction member mounted in line with the shaft; the torque loads imposed on it are recorded.

In a test the flywheels are accelerated by the driving motor until the wheel reaches a speed corresponding to the desired speed of the vehicle. The motor is then declutched or shut down and the brake applied to bring the machine to a standstill. A complete test consists of groups of between 30 and 100 such stops, with cooling periods between the groups. These machines closely simulate the conditions encountered in service.

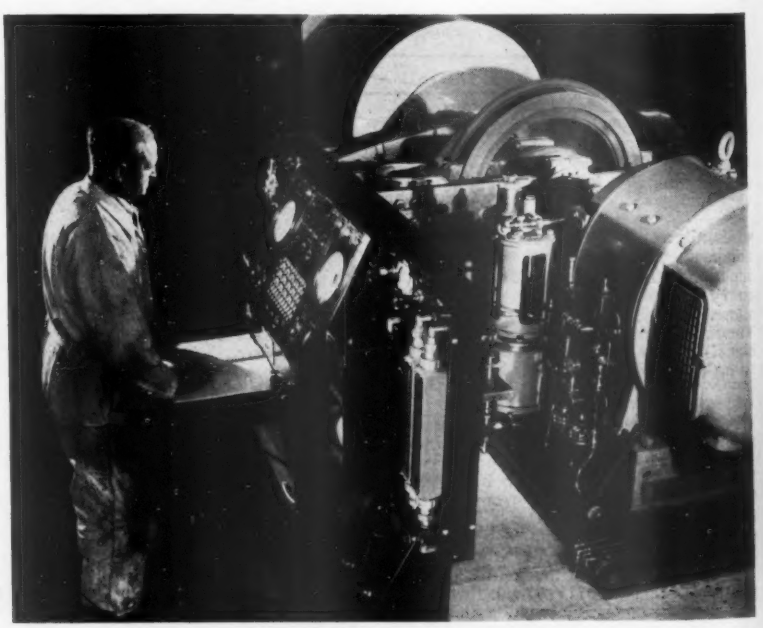
Several teams are engaged in fundamental research. On the chemical side, one team is studying the properties of asbestos. Others are studying subjects such as the development of new resins and the braking problems raised by different sets of conditions in railway and other vehicles.

Rail/Tyre Adhesion

One of these problems is that of rail/tyre adhesion. To simulate working conditions a small wheel representing a railway wheel is engaged with a large wheel which represents a rail. The brake block is pressed against the small wheel at increasing pressure until slip occurs between it and the large wheel. The friction forces arising during this process can be measured.

There is also an experimental production laboratory where methods are worked out for producing new materials in bulk, whilst ensuring that the quality of the original experimental sample is maintained. The laboratory is also concerned with the general improvement of manufacturing methods.

METROPOLITAN VICKERS LONDON OFFICES CHANGE OF ADDRESS.—The offices of the Metropolitan Vickers Electrical Co. Ltd., now at 1-3 St. Paul's Churchyard, E.C.4, will be moved shortly to 33, Grosvenor Place, S.W.1, tel. Belgravia 7011. The new address will come into force on November 24 for the Metropolitan-Vickers Electrical Co. Ltd. London District Office and Special Contracts and Traction Sales Department, and on December 1 for the Metropolitan-Vickers Electrical Export Co. Ltd.



Railway brake blocks being tested against a railway wheel on a large inertia dynamometer machine in the Ferodo laboratories

Electrification Work on the L.T. & S. Line

Work was commenced last week with the installation of the overhead contact wire between Hornchurch and Upminster in connection with the electrification of the London Tilbury & Southend Line of British Railways, Eastern Region, on 25-kV, 50-cycle a.c. system.

Wiring Train

A special wiring train of six coaches is in use. The wiring operators work from the roof of the coaches and the cable is unwound from drums mounted on wagons attached to the train. To minimise interference with the normal passenger services, the wiring is being done at off peak periods and on Sundays. Fluorescent lighting is installed on the roof of the train for working at night.

The structures supporting the overhead line equipment are mainly of four types: B.F.B. (Broad Flange Beam) section, tubular, fabricated welded rod, and double channel. On the open route sections of the double line track the great majority of the structures consist of either separate B.F.B. or tubular masts acting as single track cantilevers for each track. All overhead line structures are galvanised. Overlap spans and neutral sections are provided at convenient points along the line, which is thus sectioned electrically, not only at the feeder stations and track sectioning cabins, but also by switches at certain strategically placed overlap spans.

Overhead Line

The overhead line equipment itself is of simple construction and consists essentially of a 19/0·083 in. copper catenary which supports by droppers a 0·166 sq. in. solid grooved cadmium copper contact wire. The wires are staggered to a maximum of 15 in. The total length of wire, catenary and contact, required by the London Tilbury & Southend electrification will be about 350 miles. About one mile of the track can be wired in a 5-hr. possession. Once the wires have been put into position they have to be adjusted. The catenary is tensioned at 1,838 lb., and the contact wire at 2,000 lb. When this has been done the position of the wires is proved by passing a train fitted with a dummy pantograph beneath them which acts as a gauge. The contact wire is greased to keep it serviceable until regular running of trains commences.

The modernisation scheme for the London Tilbury & Southend Line provides for the introduction of electric traction over nearly 80 route miles, covering the lines between Fenchurch Street and Shoeburyness, Barking and Pitsea via Tilbury, and between Upminster and Grays. The work is scheduled to be completed in 1961

Repairs to L.T.E. Metropolitan Line Tunnel

London Transport is renewing a 160-ft. length of the concrete invert of the 70-year-old Metropolitan Line tunnel just north of the disused Swiss Cottage Station. The work is being undertaken to counter movement of the tunnel side walls. The cause of the movement is obscure. No interruption to rail traffic is being caused by the work, which is mostly carried out after traffic hours. The length of twin-track tunnel affected lies mostly under Finchley Road, just outside, and to the north of, Swiss Cottage Station. Work began last July and will continue until the end of this month.

Installation of Waybeams

The first stage of the work consisted of breaking away parts of the old concrete invert to allow the placing of concrete rail bearer pads, each 2 ft. wide, at 12-ft. 6-in. centres. These pads have a minimum depth of 18 in. and extend across the full width of the tunnel. Four waybeams, each consisting of two 8-in. × 6-in. rolled steel joists, were then laid along the length of tunnel. These waybeams are so spaced as to coincide with the four rails of the double-track railway laid on them and are supported by the concrete bearer pads. Hard-wood packing is inserted at the points of contact with the pads. The waybeams are in sections 12 ft. 6 in. long and are arranged to span from centre to centre of adjacent bearer pads. Correct spacing between the waybeams is assured by the use of timber transoms at intervals. The sleepers of the railway track are supported by the waybeams, enabling normal train services to be run during the next phase of operations.

The waybeams carry the tracks clear of the old concrete invert, which is being broken out in sections some 4 ft. in width between the new bearer pads. Once the space between the bearer pads is cleared down to good bottom a section of the new mass concrete invert, 18 in. thick, is formed across the tunnel. In cases where excavation is carried down to a level below the designed level of the new invert, to obtain a good bottom the difference is made up with well-rammed lean concrete.

To assist in supporting the tunnel walls, concrete haunches are formed where invert and walls meet. The concrete here is 2 ft. 8 in. thick and is reinforced with ½-in. and ¾-in. bars.

Drainage

The weep pipes through the tunnel walls are brought out above the haunch and a slight fall to the tunnel centre is provided on the upper face of the invert to let water flow to a new 9-in. spun concrete open-jointed drain between the two sets of rails. The laying of 9 in. of ballast between the top of the invert and the underside of the sleepers when the ballast is restored gives room to withdraw the waybeams. This work is being repeated section by section between the bearer pads until the whole 160-ft. length is complete.

The work is being carried out by London Transport Works & Building Department under the direction of Mr. C. E. Dunton, Chief Civil Engineer, London Transport.

INITIAL RUN OF FIRST A.C. ELECTRIC LOCOMOTIVE IN BRITAIN.—The first a.c. electric locomotive in Britain, the converted Metropolitan-Vickers gas turbine locomotive described in our issue of October 31, made its initial run with a passenger train in the London Midland Region of British Railways last Wednesday. It operated over the Styal line, 9½ route miles between Wilmslow and Mauldeth Road, the first portion of the London Midland Region main-line to be electrified at 25kW 50 cycles a.c. Regular passenger services between Crewe and Manchester will start in 1960. By 1963 they will be extended to Birmingham and Liverpool, and by 1968 there will be through electric services between Euston and Manchester and Liverpool via Birmingham.

Installing temporary droppers on catenary before running out contact wire, between Hornchurch and Upminster

Running out contact wire and installing in temporary droppers

Opening of Upminster Depot, L.T.E.

The first major stage in the London Transport Executive £2,500,000 scheme to modernise the eastern section of the District Line will be completed on December 1, when part of the new depot at Upminster is brought into use.

Upminster depot, costing £1,000,000, has some four miles of track and will accommodate 34 eight-car trains. It has a main car shed 450 ft. long with nine inspection roads and a 215 ft. long lifting shop. The depot will be used for operating purposes immediately and train examination work will also be carried out, but heavy maintenance will not be undertaken until next May when the equipping of the depot is completed.

Intercommunication

Train movements into and out of the depot, which is at the eastern end of Upminster Station, will be directed from a 40-ft. high control tower equipped with talk-back apparatus. Instructions from the tower will be heard by the train driver concerned, through a trackside loudspeaker. The driver's acknowledgement can be given at ordinary speech level and will be picked up by a trackside microphone and relayed back to the control tower. Forty 1,000-W. floodlights on two 150-ft. masts will light the depot tracks at night.

The new depot replaces the present one between East Ham and Barking, the site of which is required by the Eastern Region of British Railways in connection with the electrification of the Fenchurch Street-Southend Line.

Signalling

In addition to the new depot, the 12¼ miles of the District Line from Bow Road to Upminster are being completely re-equipped with London Transport standard signalling, replacing equipment due for renewal after many years' service. Trains will be controlled from two signal cabins at Barking and Upminster. Nine other unmanned signal cabins will be remotely-controlled by one or other of the master cabins through interlocking machines of the type developed by London Transport.

The improvements on the Upminster Line are linked with the track re-arrangements at Barking now being carried out by British Railways, Eastern Region. When these are completed in 1960 the flat junctions will be eliminated and both the District Line and Main Line services will have independent tracks. The junctions at Barking, which are used daily by 700 Underground and Main Line trains, have been a frequent cause of delays in the past and the modernisation of the District Line will result in improved running throughout the line in both east and west London.

Staff and Labour Matters

L.T.E. Busmen Protest at Service Cuts

After a six-hour conference in London on November 23, delegates representing London bus workers decided not to co-operate when London Transport introduces its cuts in services, due to commence on Wednesday, November 26. The Transport & General Workers' Union has instructed the men "to adhere strictly" to the trade union agreement on working conditions, but it is understood that this would in no way affect the carrying of standing passengers on buses at rush hours.

At the time of going to press it is not clear how what is in effect a work-to-rule policy will be operated, but is believed that the men will:—

1. Refuse to be turned short on the road to make up for service delays.
2. Refuse to make up running time lost through traffic congestion.
3. Insist on the full mealtime break.
4. Keep to the five standing rule—limiting to peak hours and late night journeys permission for five passengers to stand.
5. Insist on full travel time to points where bus crews change over.

The precise terms of the resolution, which was carried by 91 votes to 24, were as follow:—

"Delegates to instruct the members they represent not to co-operate in any way with the London Transport Executive in the matter of the cuts and to adhere strictly to the trade union agreement on working conditions. This means that our members are instructed to refuse to accept any instructions from the London Transport Executive road officials which conflict with our trade union agreement."

On November 24, the London Transport Executive announced that the cuts in services due to commence on November 26 consisted of four services to be withdrawn on weekdays and 27 on Sundays. The Executive claims that the service will still be adequate and in many cases improved in that regularity and reliability will be increased through avoidance of cuts in scheduled services through non-availability of staff. The cuts were forced on London Transport through changes in the travel habits of its customers; more people were now travelling by car and in the evenings the position was affected by people staying at home to watch television. The situation would be watched and more service provided where required.

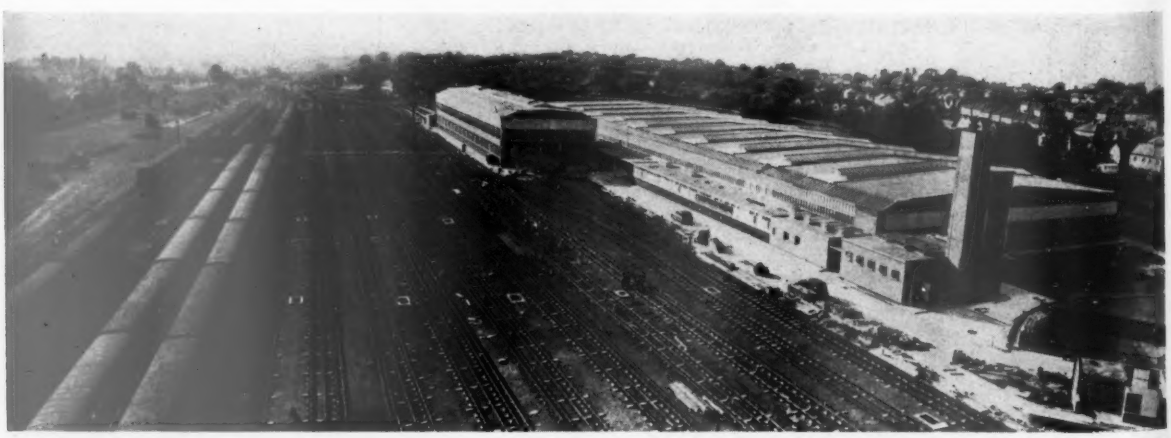
Parliamentary Notes

Railways and the Factories Bill

Some criticism was made in the Second Reading debate in the House of Commons on November 17 on the Factories Bill that, except for shopmen, the railways are excluded from its provisions for health, safety, and welfare. Shopmen are covered in one of the sub-sections of Clause 17.

Mr. David Jones (The Hartlepools—Lab.) said that under the Bill the small section of railway staff engaged in the shops run by the railways came under the provisions of the Factories Act, but those engaged in the running sheds, doing almost identical work on a smaller scale, would not be covered. All appeals had been ignored in the last eight years to do something for those engaged in the operating, locomotive, clerical, and goods departments. He had in his hand a statement (about the insanitary conditions in the local guards' room at Paddington, which was below ground level) which had been brought before the Joint Advisory Council Schemes Sub-Committee on Welfare in the Railway Industry as far back as 1949, about which nothing had been done by last January. He suggested that it would take up less time than this limited Bill to pass a Bill based on the Gowers Report as it affected railways. The Minister of Labour had said that he was proposing under this Bill to provide for modern developments in production. There was a programme of modernisation going on on the railways.

"The result of electrification," continued Mr. Jones, "means that large numbers of cables have to be carried beside the running line, and in order to maintain the cables and keep them operational, large numbers of signal and telegraph staffs will need to work for long hours alongside the lines. The permanent way men, if the higher speeds are to be maintained, will



New depot at Upminster, District Line, London Transport, showing sidings, examination shedand lifting shop

have to give continued attention to the track. All this will happen, while the noise created by the train will be substantially diminished. Yet the responsibility for providing a look-out man to protect a gang of workmen is placed on the shoulders of a ganger, getting less than £11 a week, who may find himself one day with a limited number of men under his control and having to decide whether he should withdraw one, reducing the strength of the gang, to act as a look-out man, or take the risk that nothing untoward will happen to the gang. It is unfair these days to place a responsibility of that kind upon a ganger. It ought to be placed fairly and squarely upon an official of the B.T.C.

Mr. Richard Wood, Parliamentary Secretary to the Ministry of Labour & National Service, said that up to the end of 1956, £11 m. were spent on improvements for workers in the railways, and a further £3 m. were authorised up to the end of 1957. The Government's view was that the rate of work on welfare schemes in the railways was as high as would have been achieved by any legislation, and that the statutory regulation of safety, health, and welfare on the railway, about which hon. Members had been suggesting the Government should take action, would not have achieved any more.

Production of Rolling Stock

Mr. Victor Yates (Ladywood—Lab.) raised, on an adjournment debate on November 17 the question of unemployment and short time in the Midlands, and said that only that day he had been informed that the Metropolitan-Cammell Carriage and Wagon Co. Ltd., at Saltley, which produced railway rolling stock, had informed the shop stewards that it would have to carry out substantial redundancies in 1959. If action were taken now in an issue such as the production of railway rolling stock—which was a question of investment—surely it would be possible to prevent those redundancies from adding to the problem of Birmingham and the Midlands.

Mr. W. E. Wheeldon (Small Heath—Lab.) said there was hardly a country in the world which did not use that company's products and the remainder of these sold, or a large part, went to British Railways, so that the policy of the Government towards British Railways was an important thing for this company and its employees. From inquiries he had made, he found that the company could not go ahead unless it got additional contracts from British Railways.

Mr. Richard Wood, Parliamentary Secretary to the Ministry of Transport & National Service, said it did not help to pretend that the recession was the responsibility of the Government. He was perfectly prepared to accept that one of the causes of unemployment was the deflationary measures which the Government had taken, but it was easy to criticise them and to ignore the consequences of doing nothing in the face of mounting inflation. He found that on the whole employers were not pessimistic.

BUTLER MACHINE TOOL CO. LTD. DIVIDEND.—The ordinary dividend of Butler Machine Tool Co. Ltd. for the year ended September 30, is to be 17½ per cent on the capital increased by a one-for-two capitalisation issue. Last year's total distribution was equal to 13¼ per cent on the present capital. Net profits were £88,810 (£79,640) after providing for taxation at £111,232.

Contracts and Tenders

Refrigerator wogons for Nigerian Railway

Jos. Rathgeber Waggonfabrik A.G. has received an order from the Crown Agents for two bogie refrigerator wagons with Brown Boveri refrigerator equipment, for the Nigerian Railway. Tare weight will be 29 tons and payload 22 tons.

Richard C. Gibbins & Co. Ltd. has received an order from the London Midland Region of British Railways for a set of four portable electric jacks, 24-ton per set, for delivery to Derby Carriage & Wagon Works.

British Railways, Eastern Region, has placed the following contracts:—

W. & C. French Limited, remedial measures in consequence of storm damage in the Stratford District (Areas 1 and 2), and between West Horndon and Laindon

The Westinghouse Brake & Signal Co., Ltd.: conversion of track circuits from auto-bond to resonated bond type between Maryland-Gidea Park

W. T. Henley's Telegraph Works Co., Ltd.: installation of feeder cables in connection with the Colchester-Clacton-Walton electrification

Air Pumps, Limited: supply and delivery of 10 model "155 FD4" and three model "175 PG6" mobile air compressors.

British Railways, North Eastern Region, has placed the following contracts:—

Johnson & Phillips Limited: E.H.V. switchboard, Leeds Neville Hill Motive Power Depot

H. Morfitt & Sons Limited: heating and hot water installation, Leeds Neville Hill Multi-Unit Diesel Depot

Associated Fire Alarms Limited: installation of manual fire alarm system, Darlington North Road and Stooperdale Works.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Argentina:

4 diesel railcars.

The issuing authority is the Mixed Commission from Argentine and Bolivia for the construction of the railway between Yacuiba-Santa Cruz de la Sierra y Sucre. The tender No. is 45. Bids should be addressed to the "Comision Mixta Argentino/Boliviana" at Charcas 1422, 4th Floor, Buenos Aires. The closing date is December 4, 1958. The Board of Trade reference is ESB/28407/58.

From Portuguese East Africa:

4 tank wagons for transport of petrol or liquid fuels with a capacity of 10,000 litre.

The issuing authority is the Ports, Railways & Transport Department, Lourenco Marques. The tender number is 250/58. A provisional deposit of Esc: 50,000 must be made by tenderers. The closing date is December 22, 1958. Local representation is essential. The Board of Trade reference is ESB/28334/58.

From South Africa:

46 items of overhead track equipment, including clamps, clips, hooks, insulators, lightning arresters, pot heads, thimbles, turnbuckles, bushes, sleeves, and sockets.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. C.7521: Overhead Track Equipment" should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is December 5, 1958. Local representation is essential. The Board of Trade reference is ESB/28837/58.

10,000 pairs of insulating fishplates as shown on Drawing E.3141, with fishbolts and nuts.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. A.7565: Insulating Fishplates" should be addressed to the Chairman, The Tender Board, P.O. Box 7784, Johannesburg. The closing date is December 19, 1958. Local representation is essential. The Board of Trade reference is ESB/28838/58.

From Formosa:

8,050 *tonnes* of carbon steel rails, 37 kg. in 15 or 25 m. lengths made by either basic open hearth or basic Bessemer process.

The issuing authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is US-499. This purchase will be financed by the International Cooperation Administration (I.C.A.), the agency through which the United States Government gives economic and technical assistance to other countries. The closing date is December 8, 1958. The Board of Trade reference is ESB/27736/58/ICA.

From India:

16 copper patching plates, plain, for firebox, inner; 7 ft. 5½ in. × 6 ft. 2 in. × $\frac{9}{16}$ in. thick

3 copper patching plates, plain, for firebox, inner, 6 ft. 10 in. × 3 ft. 11 in. × ½ in. thick.

The issuing authority is the Director General of Supplies & Disposals. The tender number is P/SR9/16411-J/130/IV-58. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is December 17, 1958. The Board of Trade reference is ESB/29116/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

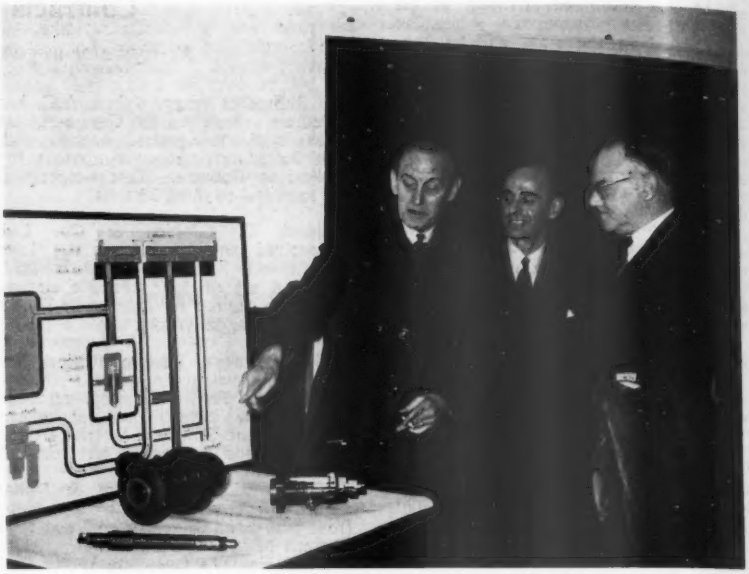
The Special Register Information Service, Export Services Branch, Board of Trade, reports that the closing dates of the call for tenders from Pakistan for diesel locomotives and broad gauge bogie wagons, reported in our issue of October 10, have been postponed to December 10, and December 15 respectively. The closing date for the call for tenders from Sudan for tank wagons reported in our issue of November 7, has been postponed to December 30.

BRITISH THOMSON-HOUSTON CO. LTD. CHANGE OF ADDRESS.—The British Thomson-Houston Co. Ltd. has transferred its offices from Crown House, Aldwych, to 33, Grosvenor Place, London, S.W.1. tel: Belgravia 7011.

Notes and News

Annual Dinner of R.O.D. Officers.—The annual dinner of R.O.D. officers was held at the Transportation Club, S.W.1, on November 21. Sir Michael Barrington-Ward presided and among those present were: Messrs. F. W. Abraham, F. L. Castle, T. G. Creighton, R. Horsfield, W. G. Tyrrell, W. Cyril Williams, E. Lake, J. Clubley Armstrong, B. W. C. Cooke, F. Horler, H. G. N. Read, C. E. R. Sherrington, and R. Pandy.

Stewarts Lane Training School.—On November 19, Mr. C. P. Hopkins, General Manager of the Southern Region of British Railways, opened the new training school for engine drivers at Stewarts Lane Locomotive Depot (for further details see editorial last week and illustrated article in this issue). Among representatives of British Railways and the railway unions who were present were Mr. W. J. A. Sykes, Chief Mechanical & Electrical Engineer, and Mr. G. A. Weeden, Motive Power Officer (Southern Region), and Mr. A. Hallworth, General Secretary of the Associated Society of Locomotive Engineers & Firemen. The accompanying illustration shows Mr. Hopkins, Mr. Weeden, and Mr. Hallworth examining a schematic diagram.



Mr. C. P. Hopkins with Mr. A. Hallworth (left) and Mr. G. A. Weeden at Stewarts Lane training school for engine drivers

Extension of the Southern Province Railway, E.A.R.&H.—The map accompanying our article on the extension of the East African Railways & Harbours Southern Province Railway to Masasi in our October 31 issue, showed a proposed extension to Lumesule Juu. Although such an extension was considered when the original line was built, we are informed that it is most unlikely that it will be built in the foreseeable future.

Conveyance of Racing Pigeons by British Railways.—A record number of racing pigeons travelled by British Railways, London Midland Region, this year. They were conveyed in 1,941 vans, each van having a capacity of some 60 baskets. Some vans went by normal passenger trains but 267 special trains were also run, 68 more than last year. The pigeons were taken to widespread destinations in the U.K. Official convoyers from the pigeon racing federations travelled with the birds to water and feed them and supervise their release for the race home.

Paddington to Milford Haven Sleeping Car Service.—British Railways, Western Region, is to introduce sleeping cars between Paddington and Milford Haven on December 1. The sleeping car train will leave Paddington at 12.45 a.m., Mondays to Saturdays, due Milford Haven at 9.13 a.m. It will return from Milford Haven at 10 p.m. on Mondays to Saturdays, due Paddington 5.30 a.m. First class sleeping accommodation will be provided in single-berth, and second class in two-berth compartments. The sleeping berth supplements will be £1 10s. first and £1 second class.

Further Diesel Services in N.E. Region.—Additional diesel trains are to be placed in service in the County Durham area of British Railways, North Eastern Region. Sixty-four of the existing weekday steam trains will be replaced by diesel trains and there will also be some extra services. For the time being, the diesel trains will run in steam train timings, but accelerations will be introduced later. Passenger train services between Sunderland and Newcastle, Sunderland and South Shields, Sunderland and Durham, and Sunderland and West Hartlepool will be almost completely provided by diesel trains. These will be composed of two-car units coupled together to form four-, six-, or eight-car trains. Each unit accommodates 12 first and 105 second class passengers.

Collision on Eastern Bengal Railway.—A mail train on the metre-gauge section of the Eastern Bengal Railway of Pakistan ran into a goods train standing in Lakhsham Station, about 80 miles from Chittagong, on November 19. Sixteen people were killed and 36 injured. Three coaches of the mail train were destroyed and three wagons of the goods train telescoped. The locomotives of both trains overturned. The Chairman of the British Transport Commission, Sir Brian Robertson, has sent a telegram of condolence to Mr. S. A. Suhrwardy, Director General of Railways, Pakistan.

Three Goods Trains and Light Engine in Collision in Fog.—Three freight trains and a light engine were involved in a collision in thick fog at Hitchin, on the Great Northern Line, of British Railways, Eastern Region, on November 19. The 3.25 a.m.

Presentation to Mr. C. H. Cowtan

After a recent meeting of the Board of Management of the Railway Benevolent Institution, Mr. K. W. C. Grand, on behalf of the Board, presenting a gold watch to Mr. C. H. Cowtan, General Secretary, in recognition of over 50 years' service to the Institution

goods train from Ferme Park to New England ran into the rear of the 3 a.m. goods, also from Ferme Park to New England. Later the 10.35 p.m. Ardsley to Finsbury Park East Goods Yard ran into the wreckage, at the same time detailing a light engine leaving Hitchin Motive Power Depot. The line was blocked and main-line trains from the North were diverted to Liverpool Street. Six main-line trains were cancelled and suburban services supplemented by a bus service between Stevenage and Hitchin.

Proposed Electrification in Argentina.—Electrification is proposed of the Buenos Aires to La Plata line of the Argentine National Railways. No particulars are available as to the voltage suggested.

Sir Brian Robertson Visits English Steel Castings Corporation Limited.—Sir Brian Robertson, Chairman of the British Transport Commission, last week visited the Sheffield works of the English Steel Castings Corporation Limited. He was shown an automatic coupler designed by the company for goods wagons, and saw a demonstration of coupling with three 16-ton. mineral wagons. The prototype coupler shown, which has not yet been tested on British Railways, is reported to be robust and simple in operation, and is based on types of couplers in use in various parts of the world.

Sir Brian Robertson at a demonstration of the English Steel Castings Corporation automatic coupling. On his right is Dr. C. J. Dadswell, Managing Director

London Transport Central Bus Service Alterations.—London Transport revised Central London bus services were put into operation last Wednesday. Three bus garages, at Clapham, Old Kent Road, and Putney Bridge were closed and the services operated from them transferred to other garages. Only four routes and five sections of other routes have been completely withdrawn on Mondays to Fridays, and all these are covered by other routes, some of which have been extended. On Saturdays four routes and 10 sections of routes are being taken off, and on Sundays 27 routes as a whole and sections of 11 other routes are being withdrawn. Nearly all of these are paralleled by other bus routes. Since 1950 the number of bus and trolleybus passengers has dropped by 21 per cent; equivalent to 700,000,000 passengers a year.

Inspection of Type "2" Co-Bo Diesel-Electric Locomotive

At Marylebone Station on November 13; Sir Brian Robertson, Chairman, British Transport Commission, with (left to right) Messrs. C. H. Flurscheim, Director & Chief Electrical Engineer, and F. Whyman, Chief Engineer, Traction Division, Metropolitan-Vickers Electrical Co. Ltd.; J. F. Harrison, Chief Mechanical Engineer, British Railways Central Staff; Major-General Ll. Wansbrough-Jones, Secretary-General, and Mr. R. C. Bond, Technical Adviser, B.T.C. (see our November 14 issue)

Forthcoming Meetings

December 1 (*Mon.*).—Railway Correspondent Travel Society, Northampton Branch, at the Liberal Club, Castilian Street, Northampton, at 7.30 p.m. Paper on "Narrow gauge industrial locomotives," by Mr. H. Jones.

December 2 (*Tue.*).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, Cardiff Section, at the Angel Hotel, Westgate Street, Cardiff, at 6.30 p.m. Paper on "Railway modernisation," illustrated, by Mr. J. R. Hammond, Assistant General Manager (Modernisation), Western Region, Paddington.

December 2 (*Tue.*).—Institute of Transport, Midland Section, at the Exchange & Engineering Centre, Birmingham, at 6.30 p.m. A talk on London Passenger Transport by Sir John Elliot.

December 2 (*Tue.*).—Institute of Traffic Administration, London Centre, at Caxton Hall, Westminster, S.W.1, at 7.15 p.m. Paper on "Modernisation of British Railways," by Mr. J. K. Blue.

December 2 (*Tue.*).—Institute of Traffic Administration, Southampton Centre, at the Chamber of Commerce, Southampton, at 7.30 p.m. Paper on "The trade union in transport," by Mr. E. Allen.

December 4 (*Thu.*).—Railways Correspondence & Travel Society, West Midlands Branch (in association with the

Birmingham Locomotive Club), at the Engineering Centre, Birmingham, at 7.15 p.m. Driver G. Joy of the G.W.R. will describe some of his experiences.

December 5 (*Fri.*).—Institute of Transport, Western Section, at the Docks Office, Bristol, at 1.15 p.m. Paper on "The oil industry and transport," by Mr. A. G. Taylor, Manager, Inland Distribution Department, Esso Petroleum Co. Ltd.

December 5 (*Fri.*).—Railway Correspondence & Travel Society, and Stephenson Locomotive Society, Scottish Branches, at 25, Charlotte Square, Edinburgh, at 7.30 p.m. Paper on "The part to be played by signalling in the modernisation plan," by Mr. O. S. Nock.

December 5 (*Fri.*)—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Paper on "London to Lisbon by rail," by Mr. R. Burrows.

December 6 (*Sat.*).—Stephenson Locomotive Society, North Western Area, at the Y.M.C.A., Fargate, Sheffield, at 6.30 p.m. Paper on "The North Eastern Region of British Railways," by Mr. R. A. Savill.

December 6 (*Sat.*).—Stephenson Locomotive Society, North Eastern Area, at the Griffin Hotel, Bear Lane, Leeds, 1, at 6.30 p.m. "The North Eastern Railway 4-4-0's," by Mr. K. Hoole.

December 6 (*Sat.*).—Stephenson Locomotive Society, North Western Area, the Conference Room, Liverpool Central Station, at 7.30 p.m. Colour slide show "More rail travel in colour," by Mr. J. B. McCaun.

December 8 (*Mon.*).—Institute of Transport, at the Jarvis Hall (R.I.B.A.), 66, Portland Place, London, W.1, at 5.45 p.m. Henry Spurrier Memorial Lecture "The history of wage negotiations in the municipal transport industry," by Mr. E. R. L. Fitzpayne.

December 9 (*Tue.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Two short papers and discussion on "Mechanical and electrical signalling installation."

December 10 (*Wed.*).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 5.30 p.m. Paper on "Maintenance and overhaul of electric locomotives and multiple-unit sets of the Manchester-Sheffield-Wath electrification," by Mr. J. S. Scott and Mr. J. K. Lord.

December 10 (*Wed.*).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas's Street, London, S.E.1, at 5.45 for 6 p.m. Paper on "American railroads," illustrated, by Mr. E. MacDonald Leo.

December 11 (*Thu.*).—British Railways, London Midland Region, Lecture & Debating Society, in the Clerical Staff Dining Club, Cardington Street, Euston, N.W.1, at 5.45 p.m. Paper on "The railways from the customer's point of view," by Mr. E. G. Whitaker, Transport Adviser to Unilever Limited.

December 11 (*Thu.*).—British Railways, Western Region, London Lecture & Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Railway Quiz—Questions on railway operation and administration. Question master, Mr. H. G. Bowles, Assistant General Manager, Administration.

December 11 (*Thu.*).—Institution of Locomotive Engineers, at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 5.30 p.m. Joint meeting with the Institution of Electrical and Mechanical Engineers. Paper on "The Deltic locomotive," by Mr. C. M. Cock.

December 11 (*Thu.*).—Institution of Railway Signal Engineers, Bristol Section, at Newport, at 6 p.m. Repeat of Chairman's address.

December 11 (*Thu.*).—Railway Correspondence & Travel Society, Bristol & District Branch, at the Grosvenor Hotel, Bristol, 1, at 7.15 p.m. Paper on "Narrow gauge railways in North Wales and the Isle of Man," by Mr. E. J. Deane.

December 12 (*Fri.*).—Institute of Traffic Administration, Kent & South Eastern Centre, at the Royal Star Hotel, Maidstone, at 7.30 p.m. Paper on "Air and rail transport in Europe," by Lt.-Colonel A. C. Ping.

December 12 (*Fri.*).—The Stephenson Locomotive Society, North Eastern Area, at the Demonstration Theatre, Northern Gas Board Showroom, 30, Grainger Street, Newcastle-upon-Tyne, 1, at 7 p.m. Talk on "Early days of the L.M. & S.R. in Scotland," by Mr. David L. Smith.

December 12 (*Fri.*).—Railway Correspondence & Travel Society, London Branch, at the Railway Clearing House, Eversholt Street, London, N.W.1, at 7.15 p.m. Paper on "Improving railway timetables," by Mr. J. H. Price.

Railway Stock Market

The cut in the bank rate to 4 per cent, and talk in the City that by early in the New Year it may be down to 3½ per cent, provided a further stimulus to stock markets particularly British Funds, which regained part of their recent sharp fall. Industrial shares continued active and strong because the lower bank rate provides a fresh boost to trade at home, but the main reason for the optimism in stock markets is the assumption that world trade will show good recovery next year.

A feature in foreign rails has been the sharp reaction in Antofagasta stocks after publication of the annual report and chairman's statement, which indicate that recovery in the railway's earnings may be gradual. The ordinary stock has declined from 16¼ to 15, and the preference was down to 31, compared with 36 a week ago; the 5 per cent Bolivia debentures remained at 95½.

Canadian Pacifics rose from $52⅞ to $53¼ with the trend on Wall Street. The preference stock, which is a sterling security, was helped by the lower bank rate and the rise in British Funds, and at 56¼ compared with 56 a week ago, while the 4 per cent debentures were marked up from 63¼ to 64¼. White Pass shares were little changed at $14¼. Algoma Central Voting trust certificates were 6¼ and the income debentures $257½.

United of Havana second income stock was firmer at 6½, but San Paulo Railway 3s. units have been easier at 2s. Mexican Central "A" bearer debentures moved fractionally lower at 73¼.

International of Central America shares reacted from $27 to $22½ and Costa Rica ordinary stock eased from 15 a week ago to 15. Brazil Railway bonds remained at 6½, Guayaquil & Quito assented bonds at 78½, and Paraguay Central prior debentures at 11, but quotations for them and most other foreign rails were scarcely tested by business.

West of India Portuguese capital stock continued at 77 and the 5 per cent debentures at 68. Nyasaland Railways shares were 12s. 9d. and the 3½ per cent debentures were again quoted at 62½.

Movements among shares of locomotive builders and engineers have been small, but in general were rather more active in the hope of speeding up of the railway modernisation programme next year. Beyer Peacock 5s. shares at 8s. 4½d. compared with 8s. 6d. a week ago. Gloucester Wagon 10s. shares kept at 16s. 9d. and Charles Roberts 5s. shares firmed up from 10s. 3d. to 10s. 6d. Wagon Repairs 5s. shares have been maintained at 10s. 4½d. On the other hand, Birmingham Wagon, after their recent rise, have reacted from 21s. 1½d. to 20s. 6d. G. D. Peters were quoted at 25s. 7½d.

Elsewhere, a feature has been a rally from 80s. to 82s. 3d. in T. W. Ward. Renold Chain moved up from 38s. 9d. to 40s. 1½d. while British Timken have been firm at 60s. 6d. and Westinghouse Brake rose from 42s. 6d. to 43s. 3d. Pressed Steel 5s. shares strengthened from 21s. 3d. to 21s. 9d. and Metal Industries have been active around 43s. 4½d. Ruston & Hornsby moved up to 23s. 6d. and Stone-Platt Industries at 44s. 6d. were at the best since the recent merger. Associated Electrical (57s. 3d.) moved slightly higher than a week ago. General Electric were 35s. 9d. and English Electric gained 1s. 6d. at 58s. 9d. Compton Parkinson 5s. shares changed hands around 12s. while Tube Investments were 78s. 4½d. Head Wrightson 5s. shares changed hands around 25s. Steel shares lost some ground on fears that lower activity in the industry leaves little scope for higher dividends, though there is general confidence that they are likely to be maintained at last year's levels.

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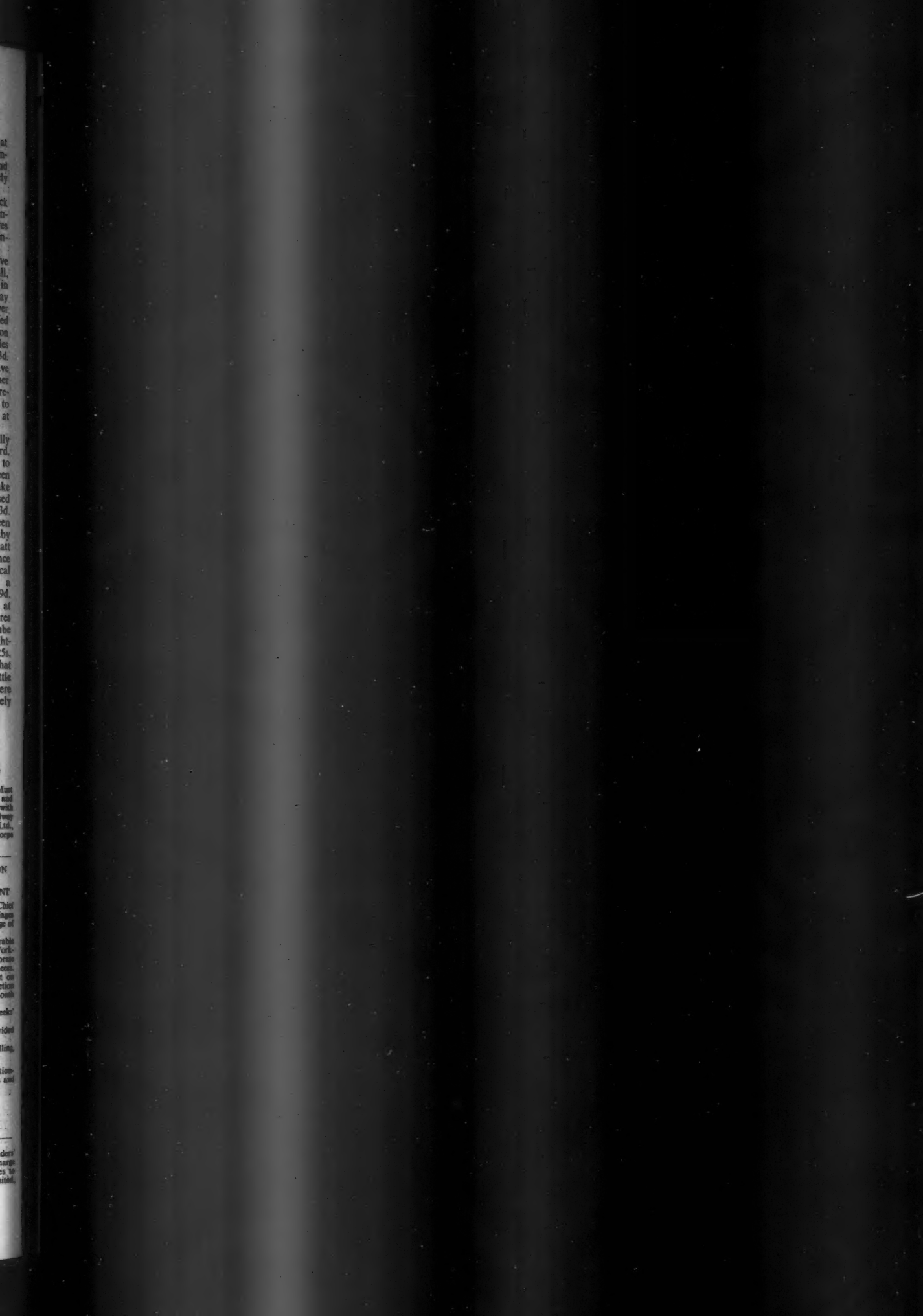
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